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Apparel

APPLICATION OF FOOT MEASUREMENTS IN THE DEVELOPMENT OF LAST SYSTEMS, by C. W. Mann and W. B. Zacharias. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Branch. 1952. 54p graph, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D.C. Mimeo: $1.50. PB 111052

The present study is concerned primarily with the development of a last system which will insure the most efficient utilization of the tariff sizes to fit as large a part of the military population as possible. Its objective is to insure a grading system which will distribute the scheduled sizes over the population in such a way as to minimize the requirements for "fringe" sizes without lessening the number of men who can be readily fitted with tariff sizes. QMC LSR 7.

Chemicals and Allied Products

Drugs and Pharmaceuticals

EVALUATION OF UNITS FOR ATROPINE SELF-INJECTION, by Archer S. Gordon, Frederick Meier and Shirley Star. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Aug 1952. 31p drawings, tables (1 fold) Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107637

1. Hypovial (Trade name) 2. Autovial (Trade name) 3. Atropine - Injection 4. Illinois. University. College of Medicine. Dept. of Clinical Science, Chicago, Ill. 5. Chicago. University. National Opinion Research Center 6. CC MD SR13.

INFLUENCE OF HYALURENIDASE ON THE REACTION OF CORNEA TO BURNS PRODUCED BY L., BY CHARLES HARRIS AND BERNARD S. COHEN, STATISTICAL ANALYSIS by Ira A. DeArmon. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Aug 1952. 11p tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107638

1. Cornea - Wounds and injuries 2. Lewisite burns - Therapy 3. Hyaluronidase - Effect on lewisite burns 4. CC MD RR 125.

Project no. 4-08-02-013.

Plastics and Plasticizers

AIRCRAFT MATERIAL SPECIFICATION: LIQUID ENGINE JOINTING COMPOUND (SHELLAC TYPE). Gt. Brit. Ministry of Supply. Mar 1952. 2p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 107426

1. Compounds, Joint-and-thread - Liquid - Gt. Brit. 2. Engines, Aircraft - Liquid jointing compounds - Gt. Brit. 3. Resins, Shellac - Uses - Gt. Brit. 4. MS DTD MS 777.

Contents: Appendix I: Method for the determination of solids content. - Appendix II: Method for the determination of drying time. - Appendix III: Method for the determination of resistance to hot mineral lubricating oil. - Appendix IV: Method for the determination of resistance to gasoline.

BONDING MATERIALS, METALLIC MATING SURFACES: LOW RF IMPEDANCE. SUMMARY REPORT, 30 MAR 1951 TO 26 MAR 1952, UNDER CONTRACT NO. AF 33 (038)-23583, by Gary Steven and W. C. Troy. Armour Research Foundation, Chicago, Ill. May 1952. 28p photos, fold diagr, graph, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107359

The object of this investigation is the fabrication and testing of low r.f. impedance bonding materials. These are to be used between metallic mating surfaces of shielding cans that enclose airborne electrical and electronic equipment and aircraft ignition systems. Other requirements for these bonding materials is a high degree of resilience to permit the use of mating surfaces with poor mechanical conformability in the assembly and disassembly of oil and pressure tight seals. An r.f. generator was designed and built to test the relative shielding effectiveness of gasket materials fabricated in the course of the development work. Composite gaskets were fabricated by combining a metallic fiber maze (0.002" copper wire) with silicone rubber and heat-resistant polyester resins.

HIGH-TEMPERATURE DIELECTRIC FILMS. TRIMONTHLY PROGRESS REPORT NO. 1, PERIOD JUN 1-AUG 31, 1948, UNDER CONTRACT NO. W36-039-SC-38105, by S. G. Cohen. Polaroid Corp. Research Dept., Cambridge, Mass. Sep 1948. 57p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107566

1. Dielectric research 2. Plastics - Dielectric properties 3. Films, Plastic - Dielectric properties 4. Fluorination - Bibliography 5. SIG Contract W36-039-sc-38105, Report no. 1.

HIGH TEMPERATURE DIELECTRIC FILM. FINAL REPORT UNDER CONTRACT NO. W-36-039-SC-38110. Sprague Electric Co., North Adams, Mass. Apr 1950. 45p diagrs, graph, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107540

1. Dielectric research 2. Films, Plastic - Dielectric properties 3. Coatings, Heat resistant 4. Styrene, Pentachloro - Copolymerization 5. Benzene, 2,3,5,6-Tetrachloro-1,4-divinyl 6. Ethane, 1 Pentachlorophenyl-1-bromo.

For 2d quarterly report, Sep-Dec 1948, see PB 107284. Dept. of the Army project: 3-93-00-500. Signal Corps project: 2005. Includes reprint from Journal of the American Chemical Society, vol. 72

(1950) p. 1133: Preparation of 1,4-Divinyl-2,3,5,6-tetrachlorobenzene and its copolymerization with styrene, by Sidnay D. Ross, Moushy Markarian, Harrison H. Young, Jr., and Mathew Nazzewski.

INELASTIC INSTABILITY AND INCREMENTAL THEORIES OF PLASTICITY, by E. T. Onat and D. C. Drucker. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. n.d. 20p diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D.C. Microfilm $1.75, Photostat $2.50. PB 107506

1. Plasticity - Theory 2. Stability, Static 3. Mathematical equations and solutions 4. GDAM A11-78/20 5. GDAM TR 78.

Contract N7onr-35801, T.O.I, NR-041-032. Date of publication is later than Apr 1951.

PHOSPHONITRILIC COMPOUNDS AS RESIN CONSTITUENTS. TECHNICAL REPORT NO. 1 ON CONTRACT N8-ONR-504, TASK ORDER NO. 1, AMENDMENT NO. 1, PROJECT NO. NR033-248, by A. E. Smith and P. M. Elliott. United States Rubber Company. Naugatuck Chemical Division, Naugatuck, Conn. Apr 1950. 13p tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107577

A preliminary survey of the literature, and some initial laboratory work, indicated that the polyphosphonitrilic chlorides were intermediates of considerable interest. Unsaturated esters and amides can be prepared from such materials, and these products are potentially polymerizable by either ethylenic addition or by building up to the P-N chains. The polyfunctionality and expected flame resistance of such compounds are desirable. In view of the excellence of triallyl cyanurate as a cross-linking agent for polyesters (1), the structurally related allyl esters and amides of phosphonitrilic acid trimer were investigated for similar uses.

Paints, Varnishes and Lacquers

AIRCRAFT MATERIALS SPECIFICATION: THINNERS FOR CELLULOSE PAINTS AND DOPES. Gt. Brit. Ministry of Supply. Apr 1952. 1p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 107424

1. Thinners - Specifications - Gt. Brit. 2. MS DTD MS 843.

Miscellaneous Chemicals

AIRCRAFT MATERIAL SPECIFICATION: INHIBITED ETHYLENE GLYCOL. SUPERSEDING D.T.D. 344A. Gt. Brit. Ministry of Supply. Dec 1951. 2p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 107378

1. Ethylene glycol - Specifications - Gt. Brit. 2. Chlorides - Determination - Gt. Brit. 3. Phosphoric acid - Determination - Gt. Brit. 4. Sulfates - Determination - Gt. Brit. 5. Benzothiazole, Mercapto - Gt. Brit. 6. MS DTD MS 779.

Contents: Appendix I: Method for the determination of phosphoric acid. - Appendix II: Method for the determination of sodium mercaptobenzothiazole. - Appendix III: Method for the determination of pH value. Appendix IV: (a) Method for determination of sulfates. (b) Method for determination of chlorides.

Electrical Machinery

Communication Equipment

CONDITIONS TECHNIQUES RELATIVES A LA RADIODIFFUSION FRANCAISE (TECHNICAL CONDITIONS RELATIVE TO FRENCH BROADCASTING SERVICE). TRANSLATED AND EDITED by F. A. Reven. France. Ministry of Information. Broadcasting Service. Jul 1952. 61p diagrs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107455

1. Radio broadcasting - France 2. NAVSHIPS T488 3. STS 146.

From Journal Officiel de la Republique Francaise, 26 Jun 1951.

DESIGN TECHNIQUES FOR INTERFERENCE-FREE OPERATION OF AIRBORNE ELECTRONIC EQUIPMENT. Frederick Research Corporation, Bethesda, Md. 1952. 459p photos, drawings, diagrs, graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D.C. Mimeo: $11.50. PB 111051

Presented are design techniques for interference-free operation of airborne electronic equipment which may be used as a guide by the aircraft and equipment designer. Section I contains a discussion of the basic theory of interference which is applied to illustrative components and system problems in Section III. Section II briefly discusses several applicable interference specifications together with methods of measurement and acceptable interference test sets. Section IV is devoted to precipitation static and techniques for its suppression. Contract AF33 (038)2341.

R. F. AMPLIFIER DESIGN FOR LOW NOISE FIGURE, by Richard Guenther. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. May 1951. 48p diagrs, fold graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107537

This paper deals with the lowest available noise figure for the three basic amplifier circuits: grounded cathode, grounded grid and grounded plate. Admittance, available gain and stability condition are derived in a general form by means of matrix algebra. The result can be applied to any active two-terminal pair network whose matrix elements are known. The noise figures and the conditions for optimizing them are derived for the above mentioned circuits. In a practical circuit the input match proved to be the only variable means of adjustment for realizing the lowest available noise

figure. For practical design purposes graphs are presented for the determination of the necessary parameters. The analysis is carried out for single stage amplifiers considering those tube capacities which are not ordinarily tuned out. From the single stage the characteristics of any combination of cascaded stages are derived by applying common rules of matrix algebra. Dept. of the Army project: 3-24-06-046. Signal Corps project: 824I. SCEL TM M-1386.

Electronics

INTERIM ENGINEERING REPORT ON CONTRACT W33-038 AC 19288, AIR MATERIEL COMMAND, WRIGHT PATTERSON AIR FORCE BASE, FOR JULY, 1952, TO DEVELOP AND PRODUCE MODELS OF BEAM POWER AMPLIFIER (100), PENTODE AUDIO AMPLIFIER (225), AND RF PENTODE AMPLIFIER (199), PREPARED by David Rufus. Sylvania Electric Products, Inc. Product Development Laboratories, Kew Gardens, N. Y. Aug 1952. 4p table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107584

1. Amplifiers, Audio frequency (AF) - Models 2. Amplifiers, Beam power - Models 3. Amplifiers, Radio frequency (RF) - Models 4. Vacuum tubes, Pentode - Models.

Report no. YF52 B1/1167-27.

DIELECTRIC AMPLIFIER FUNDAMENTALS, 2ND PRINTING. U. S. Bureau of Ships. Electronics Design and Development Division. Oct 1951. 49p photos, diagrs, graphs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $1.25. PB 111010

1. Amplifiers, Dielectric 2. Dielectric materials.

EFFECT OF RECEIVER RECTIFICATION ON IMPULSIVE NOISE TO SIGNAL RATIO. PHASE REPORT NO. 3 UNDER CONTRACT AF33(038)17144, by L. Brown, M. M. Newman and J. L. Rondeau. Lightning and Transients Research Institute, Minneapolis, Minn. Dec 1951. 19p photo, diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107415

A theoretical and experimental study of the effect of a rectifier diode on a noise pulse superposed on signal was carried out. The objective of the study was to find out if the noise pulse was in any way unduly amplified with respect to the signal by the action of the non-linear element. In the mathematical phase the characteristic of the diode was approximated by a Bernstein polynomial, and the noise pulse and signal through the diode analyzed. In the experimental phase the noise pulse signals were put through a diode and the oscillograms taken of the results. No appreciable effect of the diode on the relationship of noise to signal was observed in either phase. A mathematical study of the effect of a super-heterodyne receiver mixer on noise using the same diode was also undertaken. Again no undue amplification of noise was observed. L & T report no. 195.

ELECTRON TUBE RESEARCH AND DEVELOPMENT, SUBMINIATURE VERSIONS OF RMA TYPES 6L6, 6AG7, AND ONE-HALF OF 6AS7G AND SUBMINIATURE DIODE TYPE QF546. 18TH INTERIM ENGINEERING REPORT UNDER CONTRACT NO. AF33(038)-5734 AND S5(S51-2008), PERIOD 1 MAY-30 JUNE 1952, by Donald O. Holland. Raytheon Manufacturing Co., Newton, Mass. Jul 1952. 26p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107604

1. Tubes, Electron - Research 2. Vacuum tubes, Miniature - Research.

For 1st, 4th-6th reports see PB 103174, 102774-102776.

INFLUENCE OF A TRANSVERSE MAGNETIC FIELD ON THE CONDUCTIVITY OF THIN METALLIC FILMS, by E. H. Sondheimer. Massachusetts Institute of Technology. Research Laboratory of Electronics. May 1950. 13p graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107508

The influence of a transverse magnetic field on the conduction properties of thin metallic films, of thickness comparable with the free path of the conduction electrons, is investigated. It is shown that, owing to scattering of electrons at the boundaries of the film, the Hall coefficient is increased, and the electrical resistance oscillates with the strength of the applied magnetic field. Contract W36-039-sc-32037. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 102B. MIT RLE TR 161.

INVESTIGATION OF PERCEPTUAL FACTORS INVOLVED IN THE INTERPRETATION OF PPI-SCOPE PRESENTATIONS. II: PILOT STUDY ON FORM DISCRIMINATION, by Siegfried J. Gerathewohl and David Rubinstein. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1952. 16p photos, diagr, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107462

Experiments on the relative discriminability of six simple planimetric forms were made, using a Supersonic Trainer and radar equipment. The targets were seen from a simulated altitude of 26,000 feet and identified at 50, 20, and 10 miles. Twenty-four untrained subjects with normal visual acuity volunteered as observers. The following results were obtained: (1) The targets differed significantly as to discriminability. (2) Differences due to geometric shape were strongly suggested. (3) Position of the targets on the radar screen influenced discriminability. (4) An increase in discriminability with increased size was observed. (5) There were significant differences among individuals as to ability in identifing the various targets. For Part I see PB 101955. AAF SAM Project no. 21-24-009, Report no. 2.

LIGHTWEIGHT WAVEGUIDES. FINAL REPORT UNDER CONTRACT AF 33(038)-23588, PERIOD APR 1, 1951-JUN 30, 1952, by Albert F. DeViney.

Armour Research Foundation, Chicago, Ill. May 1952. 41p photos, drawings, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107412

Fabrication of a corrosion-resistant, lightweight, low-loss, cladded metal waveguide of a representative size is described. Each step in the process is explained in detail, so that the same procedures can be followed in manufacturing other sizes. Waveguides were produced by silver plating type 302 stainless steel strips which were then roll-formed and welded. Results of tests of waveguides manufactured in this manner are given, indicating that the main objective of low-loss, light weight, etc., which were specified in the contract, were attained. ARF Proj. 90-1027B.

PRINTED CIRCUIT TECHNIQUES: AN ADHESIVE TAPE-RESISTOR SYSTEM, by B. L. Davis. U. S. National Bureau of Standards. Feb 1952. 88p photos, diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.30. PB 107510

A carbon-resin film-type resistor in tape form which is self-adhesive and suitable for use in printed circuitry has been developed. The range covered is 10 ohms to 10 megohms. The use of asbestos paper tape and silicone resin binder results in a resistor capable of operating up to 200° C. The size of the resistor is fixed, 0.130 by 0.300 inch. Resistance values are varied by changing the resin-to-carbon ratio and by changing carbons. The curing temperature is high, 300°C for several hours. Consequently the tape is applicable at present only to glass or ceramic base materials. Satisfactory operation is considered to be less than ± 6-percent change during 500 hours under 1/4-watt load at the stated ambient temperatures. Other electrical characteristics are similar to those of commercial carbon-resin film-type resistors. MBS C 530.

QUARTERLY REPORT, 2D, 1948/49 UNDER CONTRACT NO. W-36-039-SC-32003. Columbia University. Columbia Radiation Laboratory, New York, N. Y. Dec 1948. 36p photos, diagrs, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107467

1. Radiation - Research 2. Radio waves - Research 3. High frequencies - Research 4. Inconel X (Trade name) 5. Hobs - Grinding 6. SIG Contract W-36-039-sc-32003, Report no. 2.

Dept. of the Army project: 3-99-13-022. Signal Corps project: 112 B-O. For 1st report see PB 102625; for 3d report see PB 107468.

QUARTERLY REPORT, 3D, 1948/49 UNDER CONTRACT NO. W36-039-SC-32003. Columbia University, Columbia Radiation Laboratory, New York, N. Y. Mar 1949. 44p photos, drawings, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107468

1. Radiation - Research 2. Radio waves - Research 3. High frequencies - Research 4. Hobs - Grinding 5. Vitallium (Trade name) 6. SIG Contract W-36-039-sc-32003, Report no. 3.

Dept. of the Army project: 3-99-13-022. Signal Corps project: 112 B-O. For 1st report see PB 102625; for 2d report see PB 107467.

RESEARCH ON POINT-CONTACT FIELD-CONTROLLED SEMICONDUCTOR DEVICES. THIRD INTERIM ENGINEERING REPORT, PERIOD DEC 11, 1951-MAR 11, 1952, UNDER CONTRACT NO. AF33(038)-23704, by R. C. Sirrine, D. C. Reynolds, C. S. Peet, and A. E. Middleton. Battelle Memorial Institute, Columbus, Ohio. Mar 1952. 41p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107416

This report presents the experimental work performed to date towards developing a practical fieldistor. The first half of the report discusses the work done towards producing germanium of the desired purity. Two different approaches are used for producing pure germanium. One method consists of the thermal decomposition of germanium hydride. The other approach is the usual hydrogen reduction of GeO_2 followed by appropriate purification steps.

SOME ELECTRICAL INTEGRATING CIRCUITS AND THEIR USE IN THE MEASUREMENT OF LOW FREQUENCY VIBRATION AMPLITUDES, by G. R. Richards. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1948. 18p diagrs, graphs, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N.Y. $1.25. PB 107492

The note investigates the possibility of making low frequency vibration measurements by the use of electronic acceleration measuring equipment in conjunction with electrical doubly integrating circuits. It is shown that by this method many of the disadvantages associated with the use of seismic displacement units can be obviated particularly over the frequency range 2 to 40 c.p.s. Three electrical integrating methods are discussed, the correct circuit conditions for the integration of periodic sinusoidal, rectangular and triangular waveforms are derived. A description is given of an existing acceleration measuring equipment incorporating two of the described integration networks; its sensitivity, frequency response and methods of increasing these factors are discussed in detail. Cover date is 1952. S. O. code no. 23-2724. Contents: Appendix I: Conditions for correct integration of periodic rectangular and triangular waveforms by a series R-C circuit. - Appendix II: Conditions for correct integration of periodic rectangular and triangular waveforms by an amplifier with feedback through an R-C differentiating circuit. - Appendix III: Phase considerations of double integration by one R-C and one amplifier with differentiating feedback circuit. ARC RM 2724.

STUDY OF AUTOMATIC PRINTED CIRCUIT TECHNIQUES, BY LEWIS BALAMUTH, M. U. COHEN, DAVID BUSKIN, JOHN BRADY AND ROBERT GIBBONS. BALCO RESEARCH LABORATORIES, NEWARK, N. J. FINAL REPORT UNDER CONTRACT NO. W36-039-SC-38146. Apr 1950. 175p

photos, diagrs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $6.50, Photostat $22.50. PB 107405

Research and development work leading to the establishment of automatic printed circuit techniques is discussed. The various engineering considerations, studies, tests, model fabrications, material evaluations, and measurements leading to the establishment of a recommended technique of automatic printed circuit fabrication are reviewed in detail. A complete and practical system of circuit construction is developed based on the use of conventional prefabricated components automatically mass assembled to printed circuit patterns. The system's advantages in flexibility, applicability to conventional production line processing, lower costs, reduced demand for skilled labor, and universal applicability to electronic circuitry are analyzed. Problems related to perfection of the system are presented with specific recommendations on subjects for further study and development. Dept. of the Army project no. 3-26-00-600. Signal Corps project no. 2006.

THEORETICAL INVESTIGATION OF ELECTROMAGNETIC SHIELDING, by D. B. Wright and C. R. Freberg. U. S. Naval Civil Engineering Laboratory, Solomons, Md. Nov 1949. 41p diagrs, graphs (part fold) tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107404

Accurate electrical measurements and communications are being extended to new fields continuously. Smaller and smaller quantities of energy are being detected. Unfortunately many of the quantities are less than the stray electrical fields, or noise, present in the surroundings. Therefore, it is necessary to shield or keep out this unwanted electrical energy. Shielding requirements have become more critical and also more expensive. This report studies the theoretical aspects of a wall barrier used for shielding. It shows that both radiation and induction fields exist. However, designing for the attenuation of the induction field alone also provides sufficient attenuation of the radiation field. The induction field may be disregarded for frequencies above 1 megacycle. The attenuation for these higher frequencies is determined on the basis of the radiation field. Iron, aluminum, and copper sheets all appear to exhibit suitable electrical characteristics for shielding. It is recommended that these metals be studied more fully for use in shielded rooms. The theory developed relates only to a continuous barrier. Experimental data is needed to determine the effect of various methods of construction which cannot be evaluated by a theoretical analysis. Project 411002. NCEL TR 006.

ULTRA HIGH FREQUENCY HIGH TEMPERATURE DIELECTRIC MATERIALS. TRIMONTHLY PROGRESS REPORT NO. 2, PERIOD SEP 1 TO DEC 1, 1948, UNDER CONTRACT NO. W36-039-SC-38105, by S. G. Cohen. Polaroid Corp. Research Dept., Cambridge, Mass. Dec 1948. 29p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107567

1. Styrene - Polymers - Preparation 2. Acetyl chloride, Trifluoro - Preparation 3. Acetyl chloride, Chlorodifluoro - Preparation 4. Acetophenone, Chlorodifluoro - Preparation 5. Benzene, 1,1, 2-Trichloro-2,2-difluoroethyl - Preparation 6. Styrene, Trichloro - Preparation 7. Dielectric research 8. Plastics - Dielectric properties.

ULTRA-HIGH FREQUENCY HIGH TEMPERATURE DIELECTRIC MATERIALS. TRIMONTHLY PROGRESS REPORT NO. 3, PERIOD DEC 1, 1948 TO MAR 1, 1949, UNDER CONTRACT NO. W36-039-SC-38105, by S. G. Cohen. Polaroid Corp. Research Dept., Cambridge, Mass. Mar 1949. 29p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107568

1. Styrene - Polymerization 2. Styrene, α,β,β -Trifluoro - Preparation 3. Acetophenone, Trifluoro - Preparation 4. Acetophenone, Difluoro - Preparation 5. Benzene, 1,1-Dichloro-2,2,2-trifluoroethyl - Preparation 6. Benzene, 1,2-Dichloro-1,2,2-trifluoroethyl - Preparation 7. Styrene, α, β, β -Trifluoro - Preparation 8. Styrene, α -Chloro-β,β-difluoro - Preparation 9. Styrene, 2,5-Dichloro - Preparation 10. Dielectric research 11. Plastics - Dielectric properties.

Dept. of the Army project 3-93-00-500. Signal Corps project 2005. Polaroid Corp project RC-7.

ULTRA-HIGH FREQUENCY HIGH TEMPERATURE DIELECTRIC MATERIALS. TRIMONTHLY PROGRESS REPORT NO. 4, PERIOD MAR 1 TO JUNE 1, 1949, UNDER CONTRACT NO. W36-039-SC-38105, by S. G. Cohen. Polaroid Corp. Research Dept., Cambridge, Mass. Jun 1949. 32p tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107569

1. Styrene, α,β,β-Trifluoro - Preparation 2. Styrene - Polymerization 3. Styrene - Polymers - Preparation 4. Styrene, Trifluoro - Polymerization 5. Dielectric research 6. Plastics - Dielectric properties.

Project RC-7. Dept. of the Army project 3-93-00-500. Signal Corps project 2005.

ULTRA-HIGH FREQUENCY HIGH TEMPERATURE DIELECTRIC MATERIALS. TRIMONTHLY PROGRESS REPORT NO. 5, PERIOD JUNE 1-AUG 31, 1949, UNDER CONTRACT NO. W36-039-SC-38105, by S. G. Cohen. Polaroid Corp. Research Dept., Cambridge, Mass. Sep 1949. 28p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107570

1. Styrene - Polymerization 2. Azo compounds - Reactions 3. Polystyrene - Dielectric properties 4. Dielectric research 5. Plastics - Dielectric properties.

Project RC-7. Dept. of the Army project 3-93-00-500. Signal Corps project 2005.

ULTRA-HIGH FREQUENCY HIGH TEMPERATURE DIELECTRIC MATERIALS. TRIMONTHLY PROGRESS REPORT NO. 6, PERIOD SEP 1-NOV 30, 1949, UNDER CONTRACT NO. W36-039-SC-38105,

by S. G. Cohen. Polaroid Corp. Research Dept., Cambridge, Mass. Dec 1949. 29p tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107571

1. Styrene, α, β, β-Trifluoro - Preparation 2. Styrene, α, β, β-Trifluoro - Polymerization 3. Propene, 1,1-Difluoro-2-methyl - Preparation 4. Dielectric research 5. Plastics - Dielectric properties.

Project RC-7. Dept. of the Army project 3-93-00-500. Signal Corps project 2005.

Generators, Motors

DESIGN AND DEVELOPMENT OF MINIATURE HERMETICALLY SEALED POWER TRANSFORMERS. FINAL REPORT (NO. 24) UNDER CONTRACT NO. W36-039-SC-38221, by W. C. Anderson and M. Pollack. Armour Research Foundation, Chicago, Ill. n.d. 168p photos, drawings, diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $6.25, Photostat $21.25. PB 101166s3

1. Transformers, Power - High temperature - Miniaturization.

Signal Corps project no. 32-2006-3. For 3d, 6th and 9th reports see PB 101166, 101166s, and 101166s2.

INTERFERENCE FIELDS ABOUT AIRCRAFT, PHASE I (0.1 TO 400MC). FINAL ENGINEERING REPORT 17622-4 FOR PERIOD JAN 1951-JAN 1952 UNDER CONTRACT AF33(038)-17622. Lightning and Transients Research Institute, Minneapolis, Minn. Jan 1952. 69p photos, diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107578

Since it is difficult to determine the magnitudes and patterns of interference fields present outside an aircraft fuselage, caused by interference and signal sources inside the fuselage, analytically because of the complex geometry of the aircraft frame, these fields were measured with noise meters at discrete frequencies in the range from 0.1 to 400 mc using a full size RB-37 aircraft. Theoretical considerations lead to a division of the frequency range into regions where either the radiation or induction fields predominate. Applicability of the measurements to other aircraft was considered by studying local effects about apertures and by extending the dimensions of the test aircraft. The results indicated that the external fields are determined essentially by the openings or discontinuities in the aircraft skin. Appendix I: High power noise generators. - Appendix II: Theory of electromagnetic fields around an airplane, by E. L. Hill. LTRL T 213.

Miscellaneous

INDUZIONE ELETTROMAGNETICA ED INDUZIONE MAGNETOELECTTRICA (ELECTROMAGNETIC INDUCTION AND MAGNETOELECTRIC INDUCTION), by Giancarlo Vallauri. Translated by F. Rizzo. Jul 1952. 31p diagrs, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107469

1. Induction, Electromagnetic - Italy 2. Induction, Magnetoelectric - Italy 3. Instituto Elettrotecnico Nazionale Galileo Ferraris, Turin, Italy 4. NAVSHIPS T 490.

Reprint from Annali di Fisica XX, 6, Dec 1951.

LEGIBILITY OF TYPE AS A FUNCTION OF REFLECTANCE OF BACKGROUND UNDER LOW ILLUMINATION, by Mason N. Crook, John A. Hanson, Joseph W. Wulfeck. Tufts College. Institute for Applied Experimental Psychology, Medford, Mass. Jun 1952. 21p graphs, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107505

The legibility of lower case type as a function of illumination level, reflectance of background, and type size was measured by means of speed and accuracy scores on a letter cross-out test. Simulated red cockpit illumination was used, covering the range from 0.014 to 0.129 foot-candles. Red light reflectance of background was varied from 0.26 to 0.87. Type sizes were 6- and 8-point. Scores fell off at an accelerated rate with decreasing illumination and background reflectance, and were lower under all conditions for 6- than for 8-point type. The specific application of these data to chart design will be covered in a subsequent report. Contract no. W33-038-ac-14559. AAF WADC TR 52-85.

POWER SUPPLIES, ENGINEERING REPORTS, AND DATA. PHASE III-2, INTERIM ENGINEERING REPORT UNDER CONTRACT NO. AF 33(038)-11219, by Silas S. Boers. Bendix Aviation Corp. Red Bank Division, Eatontown, N. J. Aug 1952. 35p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107413

The purpose of this development program is the design and fabrication of miniature power supplies of the rotating type suitable for operation with various pieces of airborne electronic equipment. Engineering report E.S.O. 442-III-2.

Food and Kindred Products

FRUIT AND VEGETABLE UTILISATION. REPORT OF A VISIT TO THE U.S.A. IN 1951 OF A BRITISH PRODUCTIVITY TEAM ON FRUIT AND VEGETABLE UTILISATION. Anglo-American Council on Productivity. May 1952. 70p photos, drawings, diagrs, map Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D.C. $1.00. PB 106457

1. Fruit culture 2. Fruit, Canned 3. Fruit, Frozen 4. Vegetables - Cultivation 5. Vegetables - Preservation 6. Vegetables, Frozen.

HIGH-DENSITY, FULL-FLAVOR GRAPE JUICE CONCENTRATE, by Roderick K. Eskew, Clifford

S. Redfield, Nelson H. Eisenhardt, Joseph B. Claffey and Nicholas C. Aceto. U. S. Eastern Regional Research Laboratory, Philadelphia, Pa. Sep 1952. 17p drawing, diagrs, tables Available from Eastern Regional Research Laboratory, Philadelphia 18, Pa. PB 107529

Discusses the steps experienced in making a high-density, full flavor grape juice concentrate. The report includes processing details such as aroma stripping, depectinization and clarification, juice concentration, essence preparation and sugar addition. It includes product costs, cost comparison between juice and concentrate, packaging and transportation savings, suggested equipment and equipment costs. AIC 342.

NEW FROZEN AVOCADO PRODUCT, by R. J. McColloch, B. W. Nielsen, and E. A. Beavens. U. S. Bureau of Agricultural and Industrial Chemistry, Fruit and Vegetable Chemistry Laboratory, Pasadena, Calif. Apr 1951. 4p Available from U. S. Dept. of Agriculture, Bureau of Agricultural and Industrial Chemistry, Washington 25, D. C. PB 107518

1. Guacamole (Trade name) 2. Avocados, Frozen 3. AIC 305.

RELATION BETWEEN LOCKER PLANTS AND HOME FREEZERS IN THE DISTRIBUTION OF FROZEN FOODS IN ARIZONA, by J. Stanford Larson, E. Clinton Stokes, Johnson E. Hill, James A. Mixon. U. S. Dept. of Agriculture. Production and Marketing Administration. Marketing and Facilities Research Branch. Jun 1950. 61p photos, drawing, map, tables Available free from Office of Information Services, Production and Marketing Administration, U. S. Dept. of Agriculture, Washington 25, D. C. PB 107556

1. Food, Frozen - Distribution - Arizona 2. Food, Frozen - Storage - Arizona 3. Food, Frozen - Locker plants - Arizona.

RELATION BETWEEN LOCKER PLANTS AND HOME FREEZERS IN THE DISTRIBUTION OF FROZEN FOODS IN ARIZONA. PART 2: QUANTITY BUYING FOR HOME FREEZER STORAGE, by B. Eleanor Johnson and James A. Mixon. U. S. Dept. of Agriculture. Production and Marketing Administration. Marketing and Facilities Research Branch. May 1952. 35p photos, graphs, tables Available free from Office of Information Services, Production and Marketing Administration, U. S. Dept. of Agriculture, Washington 25, D. C. PB 107557

One phase of Part 2 deals with an evaluation of the economy and convenience of using home freezers in Arizona; the other describes and appraises the manner in which home-freezer owners obtain food supplies for their freezer units. For part 1 see PB 107556.

Fuels and Lubricants

AIRCRAFT MATERIAL SPECIFICATION: LOW TEMPERATURE OIL. Gt. Brit. Ministry of Supply. Mar 1952. 6p drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 107425

1. Oils - Specifications - Gt. Brit. 2. Oils, Synthetic - Specifications - Gt. Brit. 3. Oil, Low temperature - Specifications - Gt. Brit. 4. Lubricants - Additives - Gt. Brit. 5. MS DTD MS 822.

ABSTRACT BIBLIOGRAPHY OF THE CHEMISTRY AND TECHNOLOGY OF TUNG PRODUCTS, 1875-1950, COMPILED BY RALPH W. PLANCK AND FRANK C. PACK, SOUTHERN REGIONAL RESEARCH LABORATORY, AND DOROTHY B. SKAU, NEW ORLEANS BRANCH, U. S. DEPT. OF AGRICULTURE LIBRARY. U. S. Bureau of Agricultural and Industrial Chemistry. Vol. III. 1952. 202p Available from Southern Regional Research Laboratory, 2100 Robert E. Lee Boulevard, New Orleans, 19, La. PB 107526

1. Tung oil - Bibliography 2. Tung products - Patents - Bibliography 3. Coatings - Bibliography 4. U. S. Southern Regional Research Laboratory, New Orleans, La. 5. AIC 317 vol. III.

For Vols. I-II see PB 107321-107322; for Vol. IV see PB 107527.

ABSTRACT BIBLIOGRAPHY OF THE CHEMISTRY AND TECHNOLOGY OF TUNG PRODUCTS, 1875-1950, COMPILED BY RALPH W. PLANCK AND FRED C. PACK, SOUTHERN REGIONAL RESEARCH LABORATORY, AND DOROTHY B. SKAU, NEW ORLEANS BRANCH, U. S. DEPT. OF AGRICULTURE LIBRARY. U. S. Bureau of Agricultural and Industrial Chemistry. Vol. IV. 1952. 147p Available from Southern Regional Research Laboratory, 2100 Robert E. Lee Boulevard, New Orleans 19, La. PB 107527

1.AIC 317 vol. IV.

ANALYSIS OF CRUDE SHALE OIL, by R. F. Stevens, G. U. Dinneen, and John S. Ball. U. S. Bureau of Mines. Aug 1952. 27p photo, drawings, graph, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available free from U.S. Bureau of Mines, Publications Division, 4800 Forbes St., Pittsburgh, Pa. PB 107497

1. Shale oil - Analysis 2. Shale oil - Recovery 3. BM RI 4898.

CARBON FORMATION IN FLAMES OF AROMATIC HYDROCARBONS, by W. Sacks and M.T.I. Ziebell. Canada. National Aeronautical Establishment. Jun 1952. 15p photo, drawing, graphs, tables Available from National Aeronautical Establishment, Montreal Road, Ottawa, Canada. PB 107523

A new type of burner has been employed to investigate the effect of aromatic structure on carbon formation. The liquid hydrocarbons were burned in a cone with a constant air supply. The resulting diffusion flame was very stable and the carbon stream from the flame was impinged on platinum gauze collectors. At rich mixture conditions in the burner the behaviour of the "smoking tendency" from Minchin's equations. At leaner mixtures,

however, tetralin and alkyl benzenes generally produced greater amounts of carbon than did benzene. NAEC LR-30.

DEVELOPMENT OF QUALIFICATION TEST METHODS FOR GEAR LUBRICANTS. ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL. PROGRESS REPORT NO. 1 UNDER CONTRACT NO. DA-11-022-ORD-905, by H. Rowe Barton. Aug 1952. 8p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107585

1. Gears - Lubrication 2. Lubricants - Tests 3. ARF Proj 90-1280L.

Continuation of work under Project 90-958L.

EFFECTS OF SOLVENTS IN IMPROVING BOUNDARY LUBRICATION OF STEEL BY SILICONES, by S. F. Murray and Robert L. Johnson. U. S. National Advisory Committee for Aeronautics. Sep 1952. 23p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107561

Because of the known synthetic fluids, silicones best satisfy the viscometric requirements for lubricants for turbine engines, a study was conducted to establish the effect of solvents on boundary lubrication by silicones. Boundary-lubrication data were obtained which are considered substantiating evidence for a hypothesis that, in solutions of solvents blended with silicones, the silicones form a closely packed and oriented adsorbed film on ferrous surfaces. The solutions reduced friction and prevented surface failure even when the solvent as well as the silicone was an extremely poor lubricant. These data indicate that satisfactory lubrication is the result of a solvation effect rather than a lubrication additive effect of the solvent because 30 to 50 percent of solvent was necessary for good results. The best results were obtained with solvents having dipole moments. Solutions of diesters in silicones may be practical lubricants. NACA TN 2788.

INDUSTRIAL RAW MATERIALS OF PLANT ORIGIN. 1: RECENT DEVELOPMENTS IN FIXED VEGETABLE FATS AND OILS, by T. A. Wastler, P. M. Daugherty and H. H. Sineath. Georgia Institute of Technology. State Engineering Experiment Station, Atlanta, Ga. 1952. 38p graphs, tables Available from Georgia Institute of Technology, State Engineering Experiment Station, Atlanta, Ga. PB 107445

1. Raw materials 2. Oils and fats - Supply 3. Vegetable oils - Processing. 4. G EES B 13.

Appendix: Bibliography. - Weekly price trends of fats and oils. - Monthly factory consumption of fats and oils, November, 1951-May 1952.

OXIDATION CHARACTERISTICS OF LUBRICATING FLUIDS. PART I: OXIDATION APPARATUS AND RESULTS ON SOME TYPICAL HYDROCARBONS, by C. M. Murphy, Jr. and H. Ravner. U. S. Naval Research Laboratory. Nov 1948. 26p photo, diagr, graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.75. PB 111011

Description of a closed, all-glass, semi-automatic apparatus for the study of oxidation of organic compounds. Typical runs using aliphatic, aromatic, and naphthenic hydrocarbons indicate an induction period where no oxygen absorption takes place, followed by break where absorption proceeds more or less rapidly. Length of induction period, oxidation rate, and products are functions of temperature and class of starting material. NRL C 3380.

POLYORGANOSILOXANES, ORGANOSILANES, AND ORTHOSILICATE ESTERS AS ANTIOXIDANTS, by V. G. Fitzsimmons, R. L. Merker, and W. A. Zisman. U. S. Naval Research Laboratory. Jul 1952. 20p graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111031

Aromatic substituted silicones are shown to be effective oxidation inhibitors for greases and oils containing soap-type additives. Their inhibiting action is unusual, since it is nonexistent without the presence of dispersed metallic soap pro-oxidants. The effectiveness increases as oxidation progresses. In the mechanism postulated, adsorbed phenylmethyl silicones yield resonance-stabilized free radicals which are able to interrupt the normal reaction chain of auto-oxidation and so cause the observed antioxidant action. Combinations of the aromatic silicones with the usual oil antioxidants are very effective in stabilizing greases. A study of other silicone compounds revealed that cyclohexyl silicate and tetraphenyl silicate were also good antioxidants for soap-gelled greases. NRL R 4010.

Instruments

DESIGN STUDY OF TRUE FREE AIR THERMOMETER. REPORT NO. 12 UNDER CONTRACT NO. AF 33(038)-29978. AUG 5 TO SEP 5, 1952, by A. Goldsmith. Armour Research Foundation, Chicago, Ill. Sep 1952. 14p diagr, graph, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $2.50. PB 107631

1. Thermometers, Free air - Design 2. Probes, Temperature - Design 3. ARF Proj 90-1049L, Report no. 12.

DEVELOPMENT OF SEALED SWITCH, ROTARY BAND CHANGE TYPE. FINAL PROGRESS REPORT NO. 4, CONTRACT W36-039-SC-38127, PERIOD 11 JAN 1950 - 30 SEP 1950, by D. M. O'Halloran, F. D. Mitchell, J. S. Shallcross. Shallcross Manufacturing Co., Collingdale, Pa. Oct 1950. 52p drawings, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107498

The body of this report consists of a review of the molding and seal problems and an account of the electrical and life tests with data. Conclusions are that the switch cannot be sealed if alkyd is used and that the electrical rating of 500 volts, 0.5 amp D.C. resistive load cannot be obtained. However, by protecting the contacts and contactor from the atmosphere a rating of 200 V. 0.2 amp. D.C. resistive

load is attainable. If there were room for a snap action mechanism the higher rating might be attainable. The alkyd material is very poor mechanically because of self-abrasive action and a change would be advisable to perhaps Kel-F, silicone-glass, or some as yet unknown material. Lubricants degrade the switch, and polishing and peaking contactors has little or no advantage. Army Dept. project 3-26-00-600. Signal Corps project: 2006.

DISTANT READING MANOMETER WITH PARTICULAR APPLICATION TO THE MEASUREMENT OF SMALL PRESSURES, by A. S. Halliday and H. Deacon. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1948. 5p photos, drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 107550

The function of the manometer is to enable small pressure differences to be measured at a distance. The instrument will measure either the difference of two pressures or a single pressure relative to atmosphere. Cover date is 1952. S. O. code no. 23-2744. ARC RM 2744.

ELECTRO-MECHANICAL CALCULATOR, by James S. Allen. Massachusetts Institute of Technology. Radiation Laboratory. Jan 1943. 9p diagrs, graph Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107576

An electro-mechanical calculating device has been developed. The operation is based upon the fact that the torque tending to rotate a coil in a magnetic field is proportional to the product of the current in the coil and of two or more coils mounted on a common shaft. Each coil lies in a magnetic field produced by a soft iron yoke having one or more field windings. To make this a null instrument, the coils are returned to a zero position by means of a feedback circuit. Multiplication, division, squaring, and square rooting of voltages or currents may be done with this instrument. The accuracy is at least equal to that of a good reflecting scale type d.c. meter and the response is of the order of one cycle in four seconds. MIT RAD Lab 62.

ELECTROMECHANICAL TIMING DEVICE, by B. E. Bourne. National Research Council of Canada. Radio and Electrical Engineering Division. May 1952. 25p photos, diagrs Available from National Research Council of Canada, Ottawa, Canada. $.50. PB 107524

A method of producing precision seconds pulses from a 100-kc quartz-crystal standard is described. The average error in the interval between any two markers is less than 10^{-7} seconds. These seconds pulses also initiate bursts of 1000-cycle tone with leading edges having the same degree of accuracy as the seconds pulses. A 1-kc General Radio clock is used in the electromechanical timing system described. NRCC ERB 269. NRCC 2744.

FLICKER NOISE IN VACUUM TUBES, by H. L. Clark. U. S. Naval Research Laboratory. Aug 1946. 34p photos, diagrs, graphs, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107509

Measurements made in conjunction with infrared development work at this Laboratory of tube noise below 1000 cycles per second show that it increases rapidly due to the addition of flicker noise to the already existing shot noise. Below 5 cycles per second the tube noise is predominately flicker noise and appears to increase as the reciprocal of the frequency squared as predicted by others. A mode of tube operation was arrived at which provides for low flicker noise and high grid input impedance. This circuit arrangement is unconventional and has the following essential features: No cathode resistance. Omission of grid leak resistor. Insertion of a grid blocking condenser shunted by a discharge resistor. Plate supply voltages of 40 volts or less. Operation at rated filament voltage. Of the tubes tested in this circuit arrangement, the 6J5 and triode-connected 6SJ7 were the best for both low flicker noise and high grid input impedance. NRL H 2894.

COUNTER-TYPE INTERFERENCE ANALYZER. PHASE REPORT NO. 2 UNDER CONTRACT AF33-(038)-17144, by R. C. Schwantes. Lightning & Transients Research Institute, Minneapolis, Minn. Dec 1951. 27p photos, diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107442

An interference analyzer designed to indicate the fundamental noise producing properties of radio noise is described. The instrument indicates the average number of times per second that the applied noise waveform exceeds a given rate of rise and a given amplitude, the average level of the noise voltage, and the rate of occurence of noise pulses that coincidentally exceed the given rate of rise and amplitude during a period when the average level is above any given value. Circuit diagrams and descriptions are given together with results obtained by the instrument with a typical noise source applied. L & T report no. 191.

REMOTE TANK-LEVEL INDICATORS, by J. M. Marzolf, Jr. and W. K. Gardner. U. S. Naval Research Laboratory. May 1949. 28p photos, diagrs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.75. PB 111020

Two new types of gages for indicating the liquid level in a tank have been developed. The capacitance-type gage is applicable only for use in measuring the liquid level of either (1) a single electrically conducting liquid or (2) two immiscible liquids of different specific gravities, one an electrical conductor and the other an electrical insulator. The inductance-type gage is applicable to tanks containing any liquids and for either a single liquid or two immiscible liquids in the same tank simultaneously. NRL E 3488.

REVIEW OF ELECTRONIC DIGITAL COMPUTERS, JOINT AIEE-IRE COMPUTER CONFERENCE. PAPERS AND DISCUSSIONS PRESENTED AT THE JOINT AIEE-IRE COMPUTER CONFERENCE,

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1951

PHILADELPHIA, PA., DEC 10-12, 1951, SPONSORED BY THE COMMITTEE ON COMPUTING DEVICES OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, ELECTRONIC COMPUTERS COMMITTEE OF THE INSTITUTE OF RADIO ENGINEERS, WITH THE PARTICIPATION OF THE ASSOCIATION FOR COMPUTING MACHINERY. AIEE-IRE COMPUTER CONFERENCE, PHILADELPHIA, PA., DEC 10-12, 1951. Feb 1952. 114p photos, diagrs, graphs, tables Available from American Institute of Electrical Engineers, 33 West 39th St., New York 18, N. Y. $3.50. PB 107536

Descriptions of ten large-scale electronic computers of varying design and performance were presented, giving a cross-section of the varying designs to date of both parallel and serial types of electronic computers using storage devices including mercury delay lines, magnetic drums, and cathode-ray tubes. Other papers discussed detailed operating and component experience on certain of these calculators, and the final session summarized the present state of computer development and indicated some of the future possibilities of the Transistor in computer design. Contents: Keynote address, by W. H. MacWilliams, Jr.-UNIVAC system, by J. Presper Eckert, Jr., James R. Weiner, H. Frazer Welsh, Herbert F. Mitchell.-Performance of the Census UNIVAC system, by J. L. McPherson, S. N. Alexander. - Burroughs laboratory computer, by G. G. Hoberg. - IBM card-programmed calculator, by J. W. Sheldon and Listen Tatum. - ORDVAC, by R. E. Meagher and J. P. Nash. - Design features of the ERA 1101 computer, by F. C. Mullaney. - Operation and logic of the Mark III electronic calculator in view of operating experience, by Glen E. Poorte. - University of Manchester computing machine, by F. C. Williams and T. Kilburn. - Design, construction, and performance of a large-scale, general-purpose digital computer, by B. W. Pollard. - Whirlwind I computer, by R. R. Everett. - Evaluation of the engineering aspects of Whirlwind I, by Herman H. Taylor. - EDSAC computer, by M. V. Wilkes. - National Bureau of Standards eastern automatic computer (SEAC) by S. N. Alexander. - Engineering experience with the SEAC, by Ralph J. Slutz. - Computing machines in aircraft engineering, by Charles R. Strang. - Review of the Bell Laboratories' digital computer developments, by E. G. Andrews. - Transistor as a digital computer component, by J. H. Felker. - Digital computers, present and future trends, by J. W. Forrester.

SEALS; DETERMINATION OF LEAKAGE VALUES. INTERIM ENGINEERING REPORT NO. 1, PERIOD MAY 26-AUG 26, 1952, UNDER SUPPLEMENTAL AGREEMENT NO. S3(52-380) TO CONTRACT NO. AF33(038)-15981. Bjorksten Research Laboratories, Inc. Aug 1952. 19p photos Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75 Photostat $2.50. PB 107606

The leakage rate of gases through various fabricated seals is being measured quantitatively before and after various environmental conditioning. Approximately 26% of this work has been completed. A portable leakage-rate meter is being constructed for the quantitative, nondestructive testing of sealed electronic components and assemblies on a production line. The fabrication of the meter is approximately 65% completed.

STUDY OF SPEECH PROBABILITY DISTRIBUTIONS, by W. B. Davenport, Jr. Massachusetts Institute of Technology. Aug 1950. 80p photos, diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 107507

The problem of measuring a probability concerning a random time function is shown to reduce generally to that of measuring a time average. A study is made of the error due to averaging over only a finite interval of time. A description is given of apparatus, which, with pulse technique, can measure certain probabilities concerning the instantaneous amplitude and the zero-crossing periods of any time function whose statistics lie in the range of the voice wave statistics. Measurements of the first probability distribution density of the speech-wave instantaneous amplitude for several speakers indicate that this distribution varies exponentially for large values of amplitude. Small but definite increases in conditional probability were noted for delay times of the order of magnitude of the pitch period. These measurements were of the stationary, or "long time", speech statistics. Most of the measurements were made on substantially undistorted speech; some were made to show qualitatively the effect of reflections. Contract W-36-039-sc-32037. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 102B. MIT RLE TR 148.

UPPER ATMOSPHERE RESEARCH REPORT NO. XVI: AN/DKT-7( ) 15-CHANNEL PPM TELEMETERING TRANSMITTER, by N. R. Best, R. Lowell, D. G. Mazur, and K. M. Uglow. U. S. Naval Research Laboratory. Aug 1952. 34p photos, diagrs, (part fold) Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $1.00. PB 111050

The AN/DKT-7( ) pulse-position-modulation telemetering transmitter, developed for use on medium-sized rockets, weighs 18 pounds exclusive of batteries and occupies a space approximately 9-1/4 by 11-3/4 by 9 inches including plugs and mountings. Contained in a pressurized case, the chassis is constructed in two sections which are folded together to allow access to the interior of the cubical mass and are made of heavy aluminum to control the heat generated in the unit. The transmitter operates at 227 Mc and has an output power of 10 watts peak during the 3- sec pulses. Input tubes are gated by driving diodes on their cathodes from a binary counter. Time modulation is accomplished in a diode voltage comparator in which the inputs are compared to a sawtooth voltage. External auxiliary apparatus used with the transmitter includes the flight calibrator, power supply, and control unit. NRL R 4016.

Machinery

BLOWER, SUBMINIATURE, FOR SPOT COOLING OF ELECTRONIC COMPONENTS. INTERIM ENGINEERING REPORT FOR PERIOD SEP 18, 1951 TO AUG 12, 1952, UNDER CONTRACT AF33(038)-9720. Fairchild Camera and Instrument Corporation, Jamaica, N. Y. Aug 1952. 18p photo, diagr,

tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107605

1. Blowers, Subminiature 2. Electronic equipment Cooling.

Report no. 101 E-7.

DRAWINGS OF FURNACES. Brown, Boveri & Cie., A. G., Dortmund, Ger. 1941. 14f drawings only (Legends in German) Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Enlargement Print $3.75. PB 107503

1. Furnaces - Design - Germany 2. Furnaces, Aluminum smelting - Germany 3. Micro BIOS FD 1473/46, Frames 1-5.

Abstract included. Same Abstract available as PB 107503s. Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.

ELEKTRISCH GEHEIZTER RÜHRKESSEL (ELECTRICALLY FIRED BOILER). I. G. Farbenindustrie A. G., Höchst am Main, Ger. Feb 1932. 8p drawing only (Legends in German) Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107504

1. Boilers - Design - Germany 2. Micro BIOS/ DOCS 2526/1578/45.

ELMOTORER PÅ LANTGÅRDEN (ELECTRIC MOTORS ON THE FARM), by Rolf Wilhelmson and Tore Möller. Jordbrukstekniska Institutet, Ultuna, Uppsala, Sweden. 1952. 59p photos, drawings, diagrs, graphs, tables (Text in Swedish) Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107553

1. Motors, Electric - Sweden 2. Agricultural machinery - Sweden 3. Jordbruckstekniska Institute, Ultuna, Uppsala, Sweden. Meddelande no. 242.

ESTATE YARDS. Gt. Brit. Ministry of Agriculture and Fisheries. 1952. 69p photos, drawings, diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 107481

1. Agricultural machinery - Gt. Brit. 2. Sawmills - Gt. Brit. 3. Woodworking industry - Equipment - Gt. Brit. 4. Farms - Equipment - Gt. Brit. 5. Lumber trade - Equipment - Gt. Brit. 6. MAF B 155.

S. O. code no. 24-204-55-52 .

HERMETICALLY SEALED MECHANICAL DRIVE. QUARTERLY TECHNICAL REPORT NO. H5 UNDER CONTRACT AF33 (038)-23311, PERIOD MAY-JULY 1952. Nearfott Company, Inc., Little Falls, N. J. Aug 1952. 7p tables Available from Library of Congress, Photoduplication Section, Washington 25, D.C. Microfilm $1.25, Photostat $1.25. PB 107531

1. Diaphragms, Metallic - Materials 2. Drives, Mechanical.

INTERNAL COMBUSTION ENGINES. PARTS AND INSTRUCTION BOOKS: COOPER BESSEMER MODELS. BN-8, EN-6. U. S. Bureau of Ships. Aug 1945. 1041f drawings Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Enlargement Print $137.50. PB 107499

1. BN-8 (Engine) 2. EN-6 (Engine) 3. Engines, Internal combustion - Maintenance and repair 4. Engines, Internal combustion - Parts 5. Micro NAVSHIPS D6083.

OPERATION OF THE TURBOJET THRUST COMPUTER UNDER EXTENDED RANGES OF THERMODYNAMIC PARAMETERS, by N. W. Matthews. U. S. Naval Research Laboratory. Aug 1952. 17p graphs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111042

A thrust instrument for turbojet aircraft power plants, was subject to limited ranges of thermodynamic parameters which were then considered normal to such units. This current report presents an analysis of the operation of the basic instrument at extended ranges of these parameters and presents methods whereby the basic computer circuitry may be applied without serious deterioration of instrumentation accuracy. It is concluded that the basic thrust instrument circuitry may be applied to reaction power plants over a wide range of thermodynamic parameters by appropriate selection of coefficients for the basic computer equation. Such coefficients may be incorporated into the computer by modification of the ratio transformer secondaries. NRL R 4025.

THE SHORT ROTARY FURNACE ON THE LEAD COPPER SMELTER, OKER, by Jensen. Unterharzer Berg-und Hüttenwerke, G.m.b.H., Oker, Ger. Oct 1945. 13f photos, drawing, diagrs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Enlargement Print $3.75. PB 107502

1. Furnaces, Metallurgical - Germany 2. Copper - Smelting - Germany 3. Micro BIOS DOC/ - 2896 4. Micro BIOS FD 3312/47, Frames 1-11.

Abstract included. Abstract available as PB 107502s from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.

SMELTING OF RICH MIXED OXIDES IN THE "DOERSCHEL" FURNACE DURING THE 4TH-27TH JULY 1943. Zinnwerke Wilhelmsburg G.m.b.H., Hamburg, Ger. 1943. 2f Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107501

1. Oxides - Smelting - Germany 2. Doerschel furnaces - Germany 3. Furnaces, Metallurgical - Germany 4. Micro BIOS DOCS/2615/1261 5. Micro BIOS FD 2540/46, Frames 1-2.

Abstract available as PB 107501s from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.

SUR LE FREIN A SABOTS EXTÉRIEURS ARTICULES (ON THE BRAKE WITH EXTERNAL HINGED SHOES), by K. G. Karlson. Chalmers University of Technology, Gothenburg, Sweden. 1951. 32p diagrs (Text in French) Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107407

This is a treatise on the brake with external hinged shoes. In Part 1, expressions are deduced for an ideal (perfectly rigid) mechanism; in Part 2, the influence, too, of the clearance of the pivot is considered. So far, the treatment might be described as being almost geometrical. In Part 3, some phenomena connected with the action of the brake are discussed with regard to probable or possible tendencies and to consequences for the design. Summary in English. Mechanical engineering series vol. 2, nr. 5. Also issued as Chalmers University of Technology. Transactions no. 122. Acta polytechnica 100.

USE OF A PACKAGED STEAM GENERATOR IN A MECHANICAL ENGINEERING LABORATORY, BY J. L. FRIER AND FRANK T. CARROLL, JR. COMPARATIVE ANALYSIS OF TWO ARCH-TYPE TRUSS SHAPES, by Chester R. Best. Louisiana. Engineering Experiment Station, Baton Rouge, La. 1952. 36p photos, graphs, tables (5 fold) Available from College of Engineering, Louisiana State University and Agricultural and Mechanical College, Baton Rouge 3, La. $.50. PB 107538

This report is divided into two parts. Part 1, "The Use of a Packaged Steam Generator in a Mechanical Engineering Laboratory," discusses the value of a steam boiler in a laboratory to demonstrate practical heat power applications to graduate and undergraduate students. The report lists possible study fields and tests; it recommends boiler equipment specifications. Part 2, "Comparative Analysis of Two Arch-Type Truss Shapes," discusses an analytical investigation to determine whether certain claims for marked advantages in a truss of parabolic shape are justified. The circular shape is chosen to approximate the parabolic, and the inclined straight variety is chosen as an extreme deviation. As many dimensions as possible are made the same in both trusses. The circular truss was found to have small advantage in that some lower stresses result in portions of the flanges and at the points of maximum stress in the columns. L EES B 32.

WELDING MOTION PICTURES, TECHNIQUES AND APPLICATION. U. S. Office of Technical Services. Sep 1952. 29p Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.75. PB 111037

1. Welding - Bibliography 2. Welding - Motion pictures - Bibliography 3. Motion pictures, Educational - Bibliography 4. OTS FB 3.

Medical Research and Practice

EVALUATION OF CLINICAL TESTS FOR ATHEROSCLEROSIS. I: INSTRUMENTATION, by Robert F. Redmond, Lawrence J. Milch, William W. Calhoun, and Herman I. Chinn. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1952. 19p photos, diagrs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107463

Biochemical and physiochemical procedures, which have been suggested as having diagnostic or predictive value for the occurrence of atherosclerosis, are critically evaluated. Mean values for a large series of determinations are given, along with confidence limits for each procedure. AAF SAM Project no. 21-32-027, Report no. 1.

EVALUATION OF CLINICAL TESTS FOR ATHEROSCLEROSIS. II: EFFECTS OF ADENOSINE-5-MONOPHOSPHATE ON THE SERUM AND AORTAL LIPIDS IN THE CHICKEN, by Lawrence J. Milch, Robert F. Redmond, William W. Calhoun, and Herman I. Chinn. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jul 1952. 6p photos, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107464

Adenosine-5-monophosphate (AMP) was administered in low dosage to 6-week-old, cholesterol-fed cockerels and in comparatively high dosage to 2-year-old, atherosclerotic hens. This treatment was associated with a decline in aortal fat and cholesterol concentration in both groups. In the cholesterol-fed cockerels, serum lipid analysis indicated that AMP administration was also associated with a pronounced fall in total cholesterol, a decrease in serum beta globulin and no change in the serum phospholipid/cholesterol ratio. In the atherosclerotic hens, higher dosages of AMP induced only a small decline in total serum cholesterol, a 30 percent increase in the phospholipid/cholesterol ratio and a 300 percent increase in the serum concentration of the S_f 12-20 class of lipoproteins. AAF SAM Project no. 21-32-027, Report no. 2.

EVALUATION OF CLINICAL TESTS FOR ATHEROSCLEROSIS. III: SERUM LIPOPROTEINS DURING AGING OF AIR FORCE FLYING PERSONNEL, by Lawrence J. Milch, Robert F. Redmond, and Herman I. Chinn. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. May 1952. 8p table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107465

Serum lipids and lipoproteins were determined in the three age groups, 20 to 25, 30 to 35, and 40 to 45, of flying personnel and one age group, 40 to 45, of nonflying officers. Mean values of S_f 12-20 lipoprotein concentration were determined to be a linear function of chronological age and the standard deviations of these means were shown to increase in accordance with an expected increasing divergence of individuals aging at different rates. The other serum components examined (total cholesterol, cholesterol/phospholipid ratio, and albumin/beta globulin ratio) showed neither of these characteristics. AAF SAM Project no. 21-32-027, Report no. 3.

SIMPLE MICRO METHOD FOR DETERMINING RED BLOOD CELL-CHLORINESTERASE ACTIVITY IN HUMANS, by Francis N. Marzulli, Paul F. Robinson,

Howard E. Elrod. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Aug 1952. 14p diagr, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107639

1. Blood - Cholinesterase - Microanalysis 2. Erythrocytes - Analysis 3. CC MD RR 126.

Project no. 4-08-02-005.

STUDIES ON CUTANEOUS HEAT LOSSES. PART IV: REGIONAL RATES OF CUTANEOUS HEAT LOSS IN THE ENVIRONMENTAL TEMPERATURE RANGE: 24°-38°C, by Alrick B. Hertzman, Walter C. Randall, Clarence N. Peiss, Helge Ederstrom, Russell Seckendorf. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Dec 1951. 17p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107579

The regional rates of heat loss were determined on nude resting subjects by a method of partitional calorimetry which was described in a previous AF technical report. The subjects were exposed for three to four hours to environmental temperatures of 24° to 38°C. The following areas were observed: forehead, cheeck, arm, forearm, chest, abdomen, thigh, calf, palm and sole. Contract no. AF33(038)-8585 with St. Louis University. For Parts 1-3, 5-8 see PB 106376, 106958-106959, 107466, 107580-107582. AAF TR 6680, part 4.

STUDIES ON CUTANEOUS HEAT LOSSES. PART V: KINETICS OF EVAPORATIVE WATER LOSS FROM THE SKIN, by Clarence N. Peiss and Alrick B. Hertzman. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Dec 1951. 37p drawings, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107466

1. Body, Human - Heat loss 2. Evaporation, Cutaneous 3. Skin - Temperature - Measurement 4. AAF TR 6680, Part 5.

Contract no. AF 33 (038)-8585 with St. Louis University.

STUDIES ON CUTANEOUS HEAT LOSSES. PART VI: CUTANEOUS VASCULAR RESPONSE TO RISING ENVIRONMENTAL TEMPERATURE, by Alrick B. Hertzman, Walter C. Randall, Helge E. Ederstrom, Clarence N. Peiss. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Dec 1951. 36p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107580

The vascular mechanisms available for the convection of heat to the skin surface are reviewed. Anatomical data indicate that the convection of heat could occur via both arterial and venous pathways. Contract no. AF 33(038)-8585 with St. Louis University. AAF TR 6680, part 6.

STUDIES ON CUTANEOUS HEAT LOSSES. PART VII: VASCULAR CONVECTION OF HEAT FROM ACTIVE MUSCLE TO OVERLYING SKIN, by Theodore Cooper, Walter C. Randall, Alrick B. Hertzman. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Dec 1951. 17p graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107581

An analysis of the cutaneous temperature responses which appear on mild, thythmic, local exercise, was undertaken in order to determine the possible significance of the vascular convection of heat from active muscle to the skin surface. The temperature of skin overlying active muscle showed an abrupt rise of 1.5°-3°C following the onset of the exercise. The area of skin presenting this abrupt rise did not extend beyond the palpable borders of the working muscle mass. Areas studies included the calf and the extensor surface of the forearm in man and the calf of the dog. Contract no. AF33 (038)-8585 with St. Louis University. AAF TR 6680, part 7.

STUDIES ON CUTANEOUS HEAT LOSSES. PART VIII: SHIFTING PATTERNS OF EVAPORATION FROM THE SKIN SURFACE DURING EXPOSURE TO VARIOUS THERMAL STRESSES, by Alrick B. Hertzman and Walter C. Randall. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Feb 1952. 11p graphs, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107582

Long and short cycles in sweating and in evaporation from the various skin areas were studied by continuous and simultaneous observation of the individual areas by the desiccating capsule and starch-paper-iodine techniques. An ascending successive recruitment of sweating on the chest, arm and face may be paralleled by decreasing sweating on the lower extremity. This phenomenon suggests (in some subjects), a transfer of the evaporative load to the upper parts of the body as the thermal stress mounts. Brief cycles (2-3 minutes) of sweating may be superimposed on longer cycles (10 minutes or longer). Both the longer and the shorter cycles may appear synchronously or asynchronously in the various skin areas. The tendency towards synchronicity is most marked in closely adjacent skin areas. Contract no. AF33(038)-8585 with St. Louis University. AAF TR 6680, part 8.

TEMPERATURE CHANGES IN HUMANS DURING EXPOSURE TO LOWERED OXYGEN TENSION IN A COOL ENVIRONMENT, by Arnold L. Brown, Gordon F. Vawter, and John P. Marbarger. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Sep 1952. 14p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107533

Healthy male human subjects exposed to either 380 mm. Hg (18,000 feet) without supplementary

oxygen or breathing gas mixtures low in oxygen, and in a cool environment, showed significant changes in heart rate and systolic and diastolic blood pressures when compared to the responses elicited during exposure to a cool environment uncomplicated by hypoxia. During exposure to hypoxia in a cool environment, skin and rectal temperatures were not significantly different from those observed during exposure to the same environment in the presence of adequate oxygen. The response in humans to exposure to a cool environment does not appear to be significantly altered by a reduced partial pressure of oxygen in the inspired air. This is contrary to opinion often expressed by flying personnel. AAF SAM Proj. 21-23-013, Report no. 4.

Metals and Metal Products

AIRCRAFT MATERIAL SPECIFICATION: ALUMINIUM-COPPER-MAGNESIUM-NICKEL-IRON ALLOY FORGINGS (FOR PARTS OPERATED AT ELEVATED TEMPERATURES; LOW SILICON CONTENT; PRECIPITATION TREATED AT 170°C.) Gt. Brit. Ministry of Supply. Apr 1952. 2p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 107551

1. Aircraft - Materials - Specifications - Gt. Brit. 2. Aluminum-copper-magnesium-nickel-iron alloys - Gt. Brit. 3. MS DTD 717.

AIRCRAFT MATERIAL SPECIFICATION: ALUMINIUM-COPPER-MAGNESIUM-NICKEL-IRON ALLOY FORGINGS (FOR PARTS OPERATED AT ELEVATED TEMPERATURES; LOW SILICON CONTENT; PRECIPITATION TREATED AT 200°C). Gt. Brit. Ministry of Supply. Apr 1952. 2p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 107552

1. Aircraft - Materials - Specifications - Gt. Brit. 2. Aluminum-copper-magnesium-nickel-iron alloys - Gt. Brit. 3. MS DTD 731.

GRAIN REFINEMENT IN ALUMINUM-SILICON (5%SI) AND ALUMINUM-SILICON-MAGNESIUM (7%SI, 0.3% MG) CASTING ALLOYS, by Lewis H. Fawcett, Vincent De Pierre, and Harold Bernstein. U. S. Naval Gun Factory, Washington, D. C. May 1950. 17p photos, graph, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107603

The individual effects, with regard to maximum refinement and refining efficiency, of B, Be, Cb, Cr, Mo, Ta, Ti, W and Zr, upon the grain size of the Al-Si casting alloys (Classes 2 and 3) was determined. Small rivet-shaped castings of the Al-Si alloys, containing graduated amounts of the refining elements, were made in a preheated graphite mold. The added elements had similar effects upon the grain size of the two alloys tested. Boron, Cb, Ti, Zr, Ta, Mo, W, Cr, and Be, in that order of effectiveness, refined the grain size of the two Al-Si alloys. Boron, the most effective grain refiner, produced its maximum effect at about 0.05% B concentration by weight. Microscopic examination of the Al-Si alloys with added grain refiners showed that the grain refiners altered the shape and distribution of the Si constituent in the microstructure of the alloys. Contract no. PO-62-47, Project no. NR-031-177. NGF TR 19-50.

IMPROVEMENT OF LOW ALLOY ARMOR STEELS (OD-87) 6TH QUARTERLY REPORT ON N.D.R.C. RESEARCH PROJECT NRC 14, OEMSR-450, FROM DEC 20, 1943 TO APR 20, 1944, by Murray C. Udy, Martin K. Barnett, John G. Kura, George K. Manning, Philip C. Rosenthal. Battelle Memorial Institute, Columbus, Ohio. Jun 1944. 27p photos, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107575

An attempt was made to rate the quench crack susceptibility of a number of armor plate steels. Increasing the carbon content was found to increase very conspicuously the tendency for cracking to occur. Manganese had a similar though lesser effect. The sensitivity of the test, as presently employed, does not appear sufficient to locate definitely molybdenum, nickel, chromium, sulphur, and phosphorus in their respective positions. WMC M-306. OSRD 3847

MEASUREMENT OF GAS IN ALUMINUM MELTS, by S. Lipson and H. Rosenthal. U. S. Frankford Arsenal, Philadelphia, Pa. Pitman-Dunn Laboratory. Oct 1949. 34p photos, diagr, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107511

A simple and rapid technique is being developed for measuring the gas content of aluminum melts. The method consists in casting a test ingot in a small preheated mold and allowing it to solidify under a controlled reduced pressure. After solidifying, the ingot is weighed in air and under water to determine its density. It has been shown that the volume of the precipitated gas in the ingot is inversely proportional to the atmospheric pressure above it. Further development of the test is recommended to simplify the procedure. FALR R922.

METAL TEMPERATURE IN REGENERATIVE AND RECUPERATIVE AIR PREHEATERS, by T. A. Widell and S. I. Juhasz. Sweden. Kungl. Tekniska Högskolan, Stockholm. 1952. 51p photos, diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107408

Air preheater troubles are generally consequencies of condensation from the flue gas on the metal surface. They can be avoided by increasing the metal temperature. With cold air by-pass, by-passing the flue gas, with hot air recirculation, by decreasing the air preheater surface, or by changing counterflow to parallel flow, the surface temperature at the cold end of the air preheater is increased. A new method is suggested for regenerative air preheaters; a combination of counterflow and parallel flow, "combi-flow". The relative reduction of net boiler output resulting from increase in flue gas loss and increase in fan power consumption has been computed for varying increase of metal temperature with the different methods. Acta polytechnica 103 (1952) Mechanical engineering series vol. 2, no. 6. Also issued as Kungl.

TECHNICAL REPORTS

PUBLISHED MONTHLY

News letter

U. S. DEPARTMENT OF COMMERCE

OFFICE OF TECHNICAL SERVICES

WASHINGTON 25, D. C.

NO. 41, NOVEMBER 1952

AIR CLEANING

What plant superintendents and plant maintenance engineers ought to know about the methods currently used for cleansing air of dust, smoke, fumes, fog and mist is presented in the 90-page HANDBOOK ON AIR CLEANING, just issued by the Atomic Energy Commission.

The manual is essentially a report by the Air Cleaning Laboratory at the Harvard School of Public Health on how effective the currently used air-cleaning methods are. The first chapter of this report presents briefly the theory of the different air-cleaning methods now in use. Current types of air-cleaning equipment are described and illustrated in the second chapter. Chapter III, on "Performance and Evaluation of Air Cleaning Equipment," contains an extensive discussion of test methods and valuable tabulations of performance data on the different types of air-cleaning equipment. This chapter also discusses initial and operating costs. A chapter on "Cleaning of Radioactive Aerosols" and a good bibliography are also included.

Order from Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., Price 45 cents. Make check or money order payable to the Treasurer of the United States.

ELECTRONIC MANUFACTURING PROGRESS

Military electronic equipment, with its great complexity and multiplicity of components parts, presents unbelievable problems in achieving equipment reliability. A study was therefore, made by the Stanford Research Institute for the Navy which surveyed progress all along the electronic industry front in achieving greater reliability and easier servicing of equipment. The 308-page report on this survey, entitled ELECTRONIC EQUIPMENT CONSTRUCTION, presents the progress made in miniaturization, in unitization, and in new construction techniques in all areas of electronic manufacture.

A 75-page section of the report devoted to components reviews progress in manufacture of resistors, capacitors, tubes, transformers, relays, indicating instruments, batteries, motors and servomechanisms, switches, and hermetic seals. A 40-page section on construction techniques reviews progress in printed circuits, unitized construction, mechanized production, hermetic sealing, and cast resin embedment. Another 128-page section is devoted to individual reports on manufacturing progress in 62 different electronic-equipment concerns. (Continued on page 4).

FOR STEEL FABRICATORS

In its book-length report on a survey of the steel fabrication industry in the U. S. entitled, STEEL CONSTRUCTION, a British productivity team discusses the newest and most efficient methods of in-the-shop and on-the-site manufacturing of bridge and structural steelwork. Also discusses new developments in the production of fabricated platework (especially piping and tanks) and of conveying equipment.

The report stresses the productivity-increasing factors of specific, detailed drawings and instructions that are used by most steel fabrication firms in the United States; also the increased efficiency achieved in plant layout by using overhead cranes to move all types of materials. PB 106459, Mimeo $.75. Order from OTS. See Instructions, page 4.

LATEST SHOP TECHNIQUES FOR CAST IRON

"Machining, Repairing, and Heat Treating Cast Iron Workpieces" is the title of the latest pamphlet in the Small Defense Plants Administration's series of Technical Aids for Small Business.

The machining section discusses the latest techniques for drilling, tapping, turning, milling and planing cast iron parts. The section on repairing discusses salvaging worn-out or broken cast-iron parts by these standard reclamation processes: fusion welding, non-fusion welding, and brazing. Building up of hard wearing surfaces on cast-iron parts by hard facing, metallizing, flame hardening, and heat treating are discussed in the section on heat treating. Included are directions for obtaining (free) a bibliography or recommended references for fuller information on these topics. Available free from all Commerce Department and Small Defense Plants Administration Field Offices. Order Technical Aid No. 12.

PRODUCTIVITY GUIDES FOR IRON AND STEEL INDUSTRY

The roots of high productivity in our own iron and steel industry are set into bold relief by the recommendations of a British productivity team for increasing the much lower productivity of that industry in Britain.

In their 154-page report this team points out that the raw material resources, the mechanization, and the market are much greater in U. S. than in Great Britain. Nevertheless, adoption of U. S. techniques could raise the British industry's productivity from about one-half to almost equality with ours. Specific recommendations for doing that are given in separate chapters, one on each technical phase of the iron and steel production process. Particularly significant are the chapters on: Iron-making; Steel-making; Rolling Mills; Fuel and Refractories; and Research and Technical Progress.

The business phases of the industry also are studied by a comparison of British and American practices in good chapters on: Management and Labor; Marketing; and Finance and Development. PB 106458. Price $1.25. Order from OTS. See Instructions, page 4.

CERAMIC PAPER INSULATION

"Papers" of glass, mica, asbestos, and clay have recently been developed to make possible electrical insulation which has high breakdown temperatures, hence makes possible high-operating-temperature, small-size electrical machinery.

A Naval Research Laboratory report entitled, THE ELECTRICAL PROPERTIES OF THE INORGANIC PAPERS, gives the electrical properties of these papers that the designer must know to use them in building electrical machinery. PB 111017, Mimeo $.25. Order from OTS. See Instructions, page 4.

SIMPLIFIED, HIGH-STABILITY ELECTRONIC OSCILLATORS

To provide the high-precision frequency control needed for modern communications requires quartz-crystal oscillators which do not change frequency with changes of temperature. Present practice is therefore to keep the crystal in temperature-controlled ovens.

Naval Research Laboratory scientists investigated the possibility of making oscillators in which two crystals are "hooked up" so that their frequency drifts with change of temperature are opposite, hence cancel. Their report describes theoretical and experimental aspects of the investigation and concludes that, with this arrangement, it is possible to attain "a unit possessing low thermal drift characteristics of not more than 0.0001 per cent over a temperature range of 10 degrees or 20

THE TECHNICAL REPORTS NEWSLETTER is a digest of valuable technical developments available to U. S. industry as a byproduct of Federal, State and foreign government research programs. It is published monthly by the Office of Technical Services, U. S. Department of Commerce.

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degrees C. Such a unit would obviate the necessity for bulk oven control now used where high stability is required of high-frequency crystal units." PB 106655. Mimeo $.50. Order from OTS. See Instructions, page 4.

PACKAGING ACTIVE CHLORINE CHEMICALS

To package an ointment with appreciable active chlorine content in collapsible lead tubes was found difficult because of scarcity of lead and troubles in coating the lead with wax. Army Chemical Corps tested tubes of plastic, aluminum, and lead and found that an uncoated, extruded aluminum tube was as good a container as lead for tropical and normal storage conditions. PB 106338. Microfilm $1.75, Photostat $2.50. Order from LC. See Instructions, page 4.

TOWARD BETTER STERILIZATION OF CANNED FOODS

To find out how to sterilize canned foods with the least injury to food quality, scientists working for the Quartermaster Corps Food and Container Institute are engaged in a study of the bacterial spore, clostridium botulinum, which has a high resistance to heat.

Their report discusses the heat resistance of the spore, and how this spore's heat-survival time is changed by adding vegetative cells, killed spores, or sugars to the spore suspension medium. The report also states that this spore could be separated into fractions having different resistances to heat; describes how these fractions are separated; and discusses the effect on the heat resistance of this spore produced by adding iron, calcium, salt or fatty acids to the sporulating medium. PB 105959, Microfilm $2.75, Photostat $7.50. Order from LC. See Instructions, page 4.

TREATMENT OF DAIRY WASTE BY AERATION

Department of Agriculture scientists have been able to determine more precisely the biochemical process that takes place in the aeration of dairy wastes. This knowledge enabled them to develop an improved process for treating milk wastes which is highly efficient. Their report (1) discusses the magnitude of the milk waste problem in the U. S.; (2) tells how the new process was evolved; (3) describes the new process; and (4) indicates that the "sludge" resulting from this process affords a rich source of vitamin B_{12}. Request publication No. AIC-332, available free, from Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture, Washington 25, D. C.

FRUIT AND VEGETABLE UTILIZATION

A survey was made by a British Productivity Team of techniques and processes responsible for the high productivity and excellent quality of processed fruit and vegetables in the United States. This book-length report emphasizes particularly the help provided to the food industry by Federal, State, and private research organizations. Also recommends 40 different ways management can improve existing practices. Especially good are detailed chapters on: Management and Financial Control; Raw Materials; and Quick-frozen Fruits and Vegetables. PB 106457. Price $1.00. Order from OTS. See Instructions, page 4.

TO TRAIN WORKERS IN MATERIALS HANDLING

One hundred eight of the best films on material handling, available on a free loan basis (borrower pays only return shipping cost) are listed in the BIBLIOGRAPHY OF MOTION PICTURES AND FILM STRIPS just prepared by the Office of Technical Services, U. S. Department of Commerce.

The list is divided into these subject areas: automotive units; building materials; bulk handling; conveyors; cargo handling; and industrial trucks. Each area includes films on that subject taken from a variety of different industries.

The bibliography gives each film's title, running time, a summary of its contents and the name of the Government agency or company from which the film can be obtained. PB 111026. Mimeo $.50. Order from OTS. See Instructions, page 4.

CONTINUOUS AUDIENCE REACTION TESTER FOR TRAINING FILMS

How to determine what a student is getting out of a film -- while he is getting it -- was the problem faced by scientists of Pennsylvania State College working for the Navy Special Devices Center to develop the most effective ways of teaching by films. So they developed a "film analyzer" which provides a continuous record of the student's reactions while the film is being shown. The record indentifies which part of the film produced each reaction. Separate records for up to 40 students can be produced at the same time. Operating principle, characteristics, and possible uses of the device are described in a brief report. PB 105796, Mimeo $.50. Order from OTS. See Instructions, page 4.

This Navy research program on mass training by films includes many other projects described in reports also available from OTS. A list of these reports entitled, PENNSYLVANIA STATE COLLEGE INSTRUCTIONAL FILM RESEARCH PROGRAM TECHNICAL REPORTS, gives report titles, prices, and code numbers. Available free. Order by title from OTS. See Instructions, page 4.

ELECTRONIC MANUFACTURING PROGRESS (Continued from page 1)

This report has been sold out several times since it was first reported on in the Newsletter last year. A new supply is now available. PB 101745, Mimeo $7.00. Order from OTS. See Instructions, below.

This year a symposium was held in Washington, D. C., on PROGRESS IN QUALITY ELECTRONIC COMPONENTS. It was in effect a survey of current electronic manufacturing progress, and was sponsored jointly by the American Institute of Electrical Engineers, the Institute of Radio Engineers, the Radio Television Manufacturers Association. The National Bureau of Standards and agencies of the U. S. Department of Defense participated.

The symposium consisted of nine sessions in which 48 papers were presented. Some highlights of these sessions were papers on: Ruggedized Subminiature Tubes; Component Failure Problem in Navy Electronic Equipment; Transistor Power Amplifiers; Heat Transfer from Electronic Components; Teflon Wire; Tantalytic Capacitors; Adhesive Tape Resistors; Miniaturized Components for Transistor Application; Metallic Refractories, New Materials for Electronic Industry; and Electronics in the Defense Production Program.

All these papers are now available in a 193-page volume entitled PROCEEDINGS OF THE SYMPOSIUM ON PROGRESS IN QUALITY ELECTRONIC COMPONENTS. It sells for $5.00 a copy. Order from Radio-Television Manufacturers Association, 777 14th St., N. W., Washington 5, D. C.

TO MEASURE RAPIDLY CHANGING PRESSURES

To meet the needs for an electrical pressure gage that could be used in testing supersonic aircraft models, scientists of the National Advisory Committee for Aeronautics devised an inductance type electrical pressure gage which is small, simple and rugged, can measure rapidly fluctuating pressures, remains accurate over a wide range of temperatures, and is sensitive at low pressures.

Detailed design analysis, construction details and performance tests are presented in a report designated TECHNICAL NOTE 2659. Available from National Advisory Committee for Aeronautics, 1724 "F" St., Northwest, Washington 25, D. C.

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Always enclose remittance and give PB number of each report.

Tekniska Hogskolans. Handlingar nr. 54. ACTA polytechnica 103.

SURFACE AREAS OF METALS AND METAL COMPOUNDS. A RAPID METHOD OF DETERMINATION, by C. Orr, Jr., H. G. Blocker and S. L. Craig. Jun 1952. 6p graph, table Available from Georgia Institute of Technology, State Engineering Experiment Station, Atlanta, Ga. PB 107448

1. Metal surfaces - Determination 2. Metals - Adsorptive properties 3. Metals - Corrosion prevention 4. Metals - Surface testing 5. SIG Contract W36-039-sc-38258 6. SIG Contract DA-36-039-sc-5411 7. G EES R 59.

Reprint no. 59. Vol. XIV, No. 4, 1952. Reprinted from Journal of Metals, Vol. 4, no. 6, Jun 1952 p. 657-660, and Transactions, AIME, Vol. 194, p. 657-660. The work reported in this paper was conducted by Georgia Institute of Technology Engineering Experiment Station through the sponsorship of the U. S. Army Signal Corps under contract nos. W36-039-sc-38258 and DA-36-039-sc-5411.

TITANIUM AND TITANIUM-BASE ALLOYS. Battelle Memorial Institute, Columbus, Ohio. Mar 1949. 168p photos, diagrs, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $6.25, Photostat $21.25. PB 107399

This report presents an appraisal of the worth of titanium metal and titanium-base alloys as materials of construction and also the details of the research and evaluation program on which the appraisal is based. Appendix I: Details of reduction processes investigated at Battelle Memorial Institute, by P. J. Maddex, S. A. Herres, L. W. Eastwood. - Appendix II: Reduction of titanium compounds by gases, by R. J. Lockhart, J. J. Ward, M. J. Hussey and J. W. Clegg. - Appendix III: Properties of titanium processed by U. S. Bureau of Mines and P. R. Mallory & Co., Inc. - Appendix IV: Arc melting of titanium and titanium-base alloys at Battelle Memorial Institute, by J. A. Davis, S. A. Herres and C. T. Greenidge. - Appendix V: Effect of oxygen, nitrogen, and hydrogen on iodide titanium, by Robert I. Jaffee, C. F. Powell, I. E. Campbell and Bruce W. Gonzer. - Appendix VI: Titanium-base alloys prepared by powder metallurgy methods, by Robert I. Jaffee, D. J. Maykuth, and Bruce W. Gonser. - Appendix VII: Room-temperature properties of arc-melted titanium and titanium-base alloys, by C. M. Craighead, S. A. Herres and L. W. Eastwood. - Appendix VIII: Comparisons of the properties of titanium and titanium-base alloys with other materials. - Appendix IX: Fabricating characteristics of titanium and titanium-base alloys, by H. L. Shaw and F. W. Boulger. - Appendix X: Analysis of titanium and titanium-base alloys, by E. J. Center and D. L. Chase.

Minerals and Mineral Products

CALCIUM CHLORIDE IN CONCRETE, ANNOTATED, COMPILED by H. C. Vollmer. Highway Research Board. 1952. 66p Available from Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $.60. PB 107360

1. Cements - Effects of calcium chloride - Bibliography 2. Concrete - Effects of calcium chloride - Bibliography 3. Calcium chloride - Effect on concrete - Bibliography 4. HRB B 13.

Bibliography 13, Chronologically arranged. National Research Council. Publication 217.

MAKING CONCRETE. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, England. Jul 1952. 6p photos, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 30, N. Y. $.10. PB 107422

1. Concrete - Manufacture - Gt. Brit. 2. DSIR BRD 44.

S. O. code no. 72-22-0-44.

ON THE DEVELOPMENT OF RECENT GRINDING, LAPPING AND POLISHING MATERIALS. TRANSLATED BY WERNER A. POHLE, by Anton Schwarz. Mar 1952. 16p photos, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107452

1. Abrasives - Germany 2. Diamond tools - Germany 3. Grinding wheels - Germany 4. Boron carbide - Uses - Germany 5. Polishing materials - Germany 6. Trafotherm (Trade name) 7. NAVSHIPS T457 8. STS 130.

From Feinwerktechnik, vol. 55, no. 6, 1951.

REPORT ON Q-METER TESTING AS A MEANS OF AUGMENTING SUPPLIES OF CAPACITOR MICA, by Paul M. Tyler. National Research Council. Minerals and Metals Advisory Board. Sep 1952. 61p tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. Limited supply available free from Minerals and Metals Advisory Board, National Research Council, 2101 Constitution Ave., N.W., Washington 25, D. C. PB 107636

1. Mica - Testing equipment 2. Mica - Tests 3. Meters, Q 4. MMAB-28-C.

Report prepared and submitted to the U.S. Bureau of Mines under Contract IM-7103.

Physics

General

COMPARISON OF TWO METHODS OF LINEARIZED CHARACTERISTICS FOR A SIMPLE UNSTEADY FLOW, by Roger D. Sullivan. U. S. National Advisory Committee for Aeronautics. Sep 1952. 28p diagrs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107635

Two methods of using the concept of linearized characteristics are derived for the one-dimensional unsteady flow in a tube that is rotated about an axis perpendicular to the axis of the tube. One of the methods corresponds to that used by Ferri in his basic work on the subject. Solutions are made by both methods for boundary conditions that allow ana-

lytic solutions. Comparisons shows that both methods give the same results but there are significant differences in their application. NACA TN 2794.

LITERATURE SURVEY OF THE THERMAL CONDUCTIVITY OF LIQUIDS, by Byron C. Sakiadis and Jessee Coates. Louisiana. Engineering Experiment Station, Baton Rouge, La. 1952. 72p tables Available from College of Engineering, Louisiana State University and Agricultural and Mechanical College, Baton Rouge 3, La. $1.00. PB 107539

1. Liquids - Thermal conductivity - Bibliography 2. L EES B34.

Bulletin no. 34.

METHOD FOR FINDING A LEAST-SQUARES POLYNOMIAL THAT PASSES THROUGH A SPECIFIED POINT WITH SPECIFIED DERIVATIVES, by Neal Tetervin. U. S. National Advisory Committee for Aeronautics. Sep 1952. 11p table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107458

A method is presented for finding a mth-degree polynomial that passes through a specified point with (m - j) specified derivatives (1 = j = m) and is a least-squares polynomial for other points which are spaced at unequal intervals of the independent variable. NACA TN 2774.

REPORT FOR THE YEARS 1940-1945. Gt. Brit. National Physical Laboratory. 1952. 165p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 107379

1. Laboratories, Physics - Gt. Brit.

S. O. code no. 48-100-0-45.

THEORETICAL DISTRIBUTION OF SLIP ANGLES IN AN AGGREGATE OF FACE-CENTERED CUBIC CRYSTALS, by John M. Hedgepeth. U. S. National Advisory Committee for Aeronautics. Aug 1952. 32p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107398

An analysis of the relative frequency of occurrence of any given slip-line angle in a plastically deformed polycrystal composed of face-centered cubic crystals is presented for the case of simple tension. The results are compared with those obtained for a polycrystal composed of crystals which have but a single mode of slip and with experimental results. The comparisons show that the differences between the results obtained by the two theories become greater as the stress is increased. The comparison with experiment of the face-centered cubic theory is somewhat better than that of the single-slip-mode theory, but the errors are appreciable. NACA TN 2777.

ZUR DARSTELLUNG DES STABILITÄTSGEBIETES BEI SCHWINGUNGSAUFGABEN MIT HILFE DER HURWITZDETERMINANTEN (ON REPRESENTATION OF THE STABILITY REGION IN OSCILLATION PROBLEMS WITH THE AID OF THE HURWITZ DETERMINANTS), by E. Sponder. Aug 1952. 12p graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107420

This report concerns the use of the Hurwitz determinants in defining boundaries of regions where oscillatory phenomena are to be stable or unstable. A simplification is suggested as an aid in reducing the computations usually required, although it is emphasized that point checks in the various regions defined are required using the complete set of Hurwitz determinants or some other complete stability determination. NACA TM 1348.

Printing, Publishing, and Allied Industries

BASIC REQUIREMENTS FOR ELECTROTYPES, ENGRAVING, COMPOSITION AND LOCKUP STANDARDS. International Association of Electrotypers and Stereotypers, Inc. Jan 1950. 20p photos Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington 5, D. C. $.25. PB 107600

1. Electrotyping.

ELECTROTYPING IN THE GOVERNMENT PRINTING OFFICE, by John A. McLean, Morris S. Kantrowitz and Clarence L. Buck. Research and Engineering Council of the Graphic Arts Industry, Inc., Washington, D. C. 1949. 18p Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington 5, D. C. $.15. PB 107599

1. Electrotyping.

LISTING OF RESEARCH AND ENGINEERING PROGRAMS PERTAINING TO THE GRAPHIC ARTS. Research and Engineering Council of the Graphic Arts Industry, Inc., Washington, D. C. Jul 1952. 36p Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington 5, D. C. $1.00. PB 107598

1. Graphic arts - Research.

LISTING OF RESEARCH DEVELOPMENTS AND ENGINEERING PROGRAMS PERTAINING TO THE GRAPHIC ARTS. Research and Engineering Council of the Graphic Arts Industry, Inc., Washington, D. C. Jun 1949. 21p Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington 5, D. C. $1.00. PB 107596

1. Graphic arts - Research.

Graphic Arts Research and Engineering Council bulletin. Research program series no. 1.

PROCEEDINGS OF CONFERENCE ON PLATES HELD AT BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO, FEB 16, 1950. Research and Engineering Council of the Graphic Arts Industry, Inc., Washington, D. C. 1950. 22p Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington 25, D. C. $1.00. PB 107602

1. Films, Plastic - Use in electroplating 2. Electroplating - Equipment 3. Screens, Printing - Silk.

Conference report no. 1.

RULING INKS AND DYES, by Morris S. Kantrowitz and Robert H. Simmons. U. S. Government Printing Office. 1948. 8p tables Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington 5, D. C. $.10. PB 107595

1. Inks, Printing 2. Inks, Printing - Dyes and dyeing 3. Machines, Ruling - Inks.

GPO-PIA joint research bulletin. Ink series no. 1.

TRANSPARENT PROOFS FROM TYPE FORMS, GOVERNMENT PRINTING OFFICE PROCESS, by Morris S. Kantrowitz, Arthur A. Dillon, and Earl J. Gosnell. Research and Engineering Council of the Graphic Arts Industry, Inc., Washington, D. C. 1951. 22p drawings Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington 5, D. C. $.30. PB 107601

1. Transparencies.

Composition series no. 3.

Structural Engineering

BENDING OF THIN PLATES WITH COMPOUND CURVATURE, by H. G. Lew. U. S. National Advisory Committee for Aeronautics. Oct 1952. 49p diagrs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107633

A method is developed for analysis of deformations of doubly curved thin plates under edge or surface loads for small deflections. The problem is approached from thin-shell theory so that the plate is to form part of a shell of revolution. An analytical solution is presented completely for a plate with arbitrary meridian of small curvature loaded by normal edge loads on one pair of opposite edges and numerical calculations are given for the deflection and moment distribution for a particular meridian curve. The method developed may be applied to other problems of bending of doubly curved thin plates under edge or surface loads but the theory is limited to small deflections of the plate considered. NACA TN 2782.

DURABILITY OF ROOFING SLATES. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, England. Aug 1952. 4p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 107423

1. Slate, Roofing - Durability - Gt. Brit. 2. Roofs, Slate - Durability - Gt. Brit. 3. DSIR BRD 45.

S. O. code no. 72-22-0-45.

EXPERIMENTAL AND THEORETICAL DETERMINATION OF THERMAL STRESSES IN A FLAT PLATE, by Richard R. Heldenfels and William M. Roberts. U. S. National Advisory Committee for Aeronautics. Aug 1952. 35p photo, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107396

Thermal stresses induced in a flat, rectangular 75S-T6 aluminum-alloy plate by nonuniform heating are determined both experimentally and theoretically. The characteristics of commercially available bonded resistance wire strain gages are first investigated to determine their suitability for measuring stresses under simple conditions of stress and temperature. The gages are then used to measure thermal stresses in the flat plate in order to study their suitability under more complicated conditions. The experimental results are found to be in satisfactory agreement (within ± 5 percent of maximum calculated stress) with an approximate theoretical solution of the problem. NACA TN 2769.

GEOMETRY OF CLASSROOMS AS RELATED TO NATURAL LIGHTING AND NATURAL VENTILATION, by William W. Caudill and Bob H. Reed. Texas. Engineering Experiment Station, College Station, Texas. Jul 1952. 55p photos, diagrs, tables Available from Texas Engineering Experiment Station, College Station, Texas. PB 107441

1. Ventilation - Buildings 2. School buildings - Construction 3. Buildings - Lighting, Natural 4. TU EES RR 36.

Contents: Part 1: General discussion of classroom geometry and testing methods used. - Part 2: Reports of specific tests relating to the geometry of the classroom. - Part 3: An analysis of nine classroom shells.

INTRODUCTION TO ELECTRICAL-CIRCUIT ANALOGIES FOR BEAM ANALYSIS, by Stanley U. Benscoter and Richard H. MacNeal. U. S. National Advisory Committee for Aeronautics. Sep 1952. 48p diagrs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107495

An application is described of the well-known analogy between electrical and mechanical systems to the calculation of stresses and deflections of beams. The object of the present paper is to give an explanation of the analogies in an elementary manner which will enable a structural engineer to understand the process of designing the electrical circuits. The analogies which are discussed are those that are now being used in the Cal-Tech analog computer. Analogies are given for beams in bending and torsion with static loads and in vibrational motion. NACA TN 2785.

LIABILITY FOR SIDEWALK CONDITIONS, AND REPAIR THEREOF. Association of Washington Cities. Mar 1952. 16p Available from Association of Washington Cities, 250 Smith Hall, University of Washington, Seattle 5, Washington. PB 107417

1. Sidewalks - Repair.

Information bulletin no. 138.

RENDERING OUTSIDE WALLS. Gt. Brit. Ministry of Works. 1952. 4p table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 107542

1. Walls, External - Weatherproofing - Gt. Brit. 2. MOW AL 27.

SERVICE FAILURES IN AIRCRAFT STRUCTURES ASSOCIATED WITH FATIGUE, REPEATED OR DYNAMIC LOADS, by J.B.B. Owen. Gt. Brit. Ministry

of Supply. Aeronautical Research Council. Aug 1946. 13p photos, drawings, diagr, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107548

This note gives examples and photographs of several structural defects which have occurred in service and shows, that, although many failures may be due to fatigue or the application of excessive static loads, some are probably influenced by the repeated application of loads of high intensity, and by loads of a dynamic character. It is suggested that changes in design aimed at (1) eliminating the loads causing failure, e.g., reducing in one case tab backlash, and (2) alleviating stress concentrations, are ways of reducing the incidence of defects due to repeated loading. Cover date is 1952. S. O. code no. 23-2688. ARC RM 2688.

THERMAL BUCKLING OF PLATES, by Myron L. Gossard, Paul Seide, and William M. Roberts. U. S. National Advisory Committee for Aeronautics. Aug 1952. 39p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107397

An approximate method, based on large-deflection plate theory, for calculating the deflections of flat or initially imperfect plates subject to thermal buckling is outlined. The method is used to determine the deflections of a simply supported panel subjected to a tentlike temperature distribution over the plate surface. Experimental results for a particular panel are in good agreement with the theoretical results considered in the test. NACA TN 2771.

Textiles and Textile Products

MECHANICS OF ELASTIC PERFORMANCE OF TEXTILE MATERIALS: GRAPHICAL ANALYSIS OF FABRIC GEOMETRY, by E. V. Painter. Fabric Research Laboratories, Inc., Boston, Mass. 1952. 33p diagrs, graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $1.00. PB 111028

Graphs have been developed to simplify the study of fabric geometry. A simultaneous plot of the mathematical relations developed by Peirce aids in visualizing dimensional changes in fabrics and gives accurate values of the various parameters without lengthy calculations and interpolations from tables. The use of the graphs is discussed as they apply to various types of weaves, fibers, and their dimensional changes. QMC TSR 72.

MODIFIED TECHNIQUE FOR MAKING COTTON FIBER MATURITY TESTS, by Frances Carpenter and Roland L. Lee, Jr. U. S. Dept. of Agriculture. Production and Marketing Administration. Cotton Branch. Apr 1950. 19p graph, tables Available from U. S. Dept. of Agriculture, Production amd Marketing Administration, Cotton Branch, Washington 25, D. C. PB 107516

1. Cotton - Maturity tests.

RELATION OF COUNT-STRENGTH PRODUCT OF LONG-DRAFT PROCESSED YARN TO SIX ELEMENTS OF RAW COTTON QUALITY AND YARN SIZE, by Robert W. Webb and Howard B. Richardson. U. S. Dept. of Agriculture. Production and Marketing Administration. Cotton Branch. Aug 1950. 63p graphs, tables Available from U. S. Dept. of Agriculture. Production and Marketing Administration, Cotton Branch, Washington 25, D.C. PB 107517

1. Cotton - Tensile tests 2. Cotton yarn - Tensile tests 3. Cotton fibers - Physical properties.

SILK SCREEN PRINTING TECHNIQUES AND APPLICATIONS, by Herbert A. Thom. U. S. Office of Technical Services. Sep 1952. 7p drawings Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.25. PB 111029

1. Printing - Screen processes 2. Textiles - Screen printing 3. TAS 102.

Transportation Equipment

Aeronautics

Aircraft

CALCULATED LOADINGS DUE TO INCIDENCE OF A NUMBER OF STRAIGHT AND SWEPT-BACK WINGS, by V. M. Falkner, with an appendix by Doris Lehrian. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1948. 43p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.75. PB 107472

In this report are collected together the calculated aerodynamic loadings due to incidence of a number of straight and swept-back wings. The calculations follow in the main the routine described previously in another report, but include additions concerned with induced camber and induced drag. An additional investigation is made of the effect of the N.A.C.A. camber on the properties at zero lift of a rectangular wing of aspect ratio 6. A table is given of loading functions for use in auxiliary solutions when the wing plan has a discontinuity of direction at an arbitrary position along the span. S. O. code no. 23-2596. Cover date is 1952. Appendix, p. 7-43, is Calculation of equivalent slopes to represent the N.A.C.A. camber line. ARC RM 2596.

EQUIVALENT PLATE THEORY FOR A STRAIGHT MULTICELL WING, by Stanley U. Benscoter and Richard H. MacNeal. U. S. National Advisory Committee for Aeronautics. Sep 1952. 32p diagrs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107496

A structural theory is developed for the analysis of thin multicell wings with straight spars and perpendicular ribs. The analysis is intended to be suitable for supersonic wings of low aspect ratio. Deflections due to shearing strains are taken into account. The theory is expressed entirely in terms of first-order difference equations in order that

analogous electrical circuits can be readily designed and solutions obtained on the Cal-Tech analog computer. NACA TN 2786.

FLOW STRUCTURE AND PRESSURE RECOVERY IN A SUPERSONIC OPEN JET WIND TUNNEL, by J. G. Hall. Canada. National Aeronautical Establishment. 1952. 43p photos, drawings, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. Limited supply available for exchange from National Aeronautical Establishment, Montreal Road, Ottawa, Canada. PB 107587

Flow structure and pressure recovery in the N.R.C. open jet wind tunnel has been investigated as a function of supersonic diffuser throat area at Mach numbers 1.4, 1.8, and 3.5 with the tunnel empty. Balance chamber pressure is independent of supersonic diffuser throat area unless the diffuser functions as a second supersonic nozzle with subsonic flow in the diffuser entrance, sonic flow at the throat, and supersonic downstream of the throat. Smooth control of balance chamber pressure by adjustment of the diffuser throat is obtained only at low Mach numbers. At low Mach numbers, below about 1.8 in the present case, maximum pressure recovery for model testing is limited to that for a parallel jet, the diffuser functioning as a second supersonic nozzle. In this case the recovered pressure ratio is closely given by the ratio of supersonic nozzle to diffuser throat areas. At high Mach numbers, a pressure recovery exceeding that for a parallel jet with sonic flow at the diffuser throat may be obtained, the test rhombus flow being suitable for model testing. This more efficient diffusion at high Mach numbers is achieved by starting the tunnel with the diffuser throat fully open and closing it up after supersonic flow has developed throughout. In this case the flow remains supersonic in the diffuser entrance. NAEC N9. NAEC LR 19.

MODEL TESTS IN THE 24-FT. WIND TUNNEL TO DETERMINE THE OPTIMUM ANGLE FOR RELEASE OF A COCKPIT HOOD, by R. Fail. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1948. 2p drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 107546

For some time now, it has been recommended that mechanical assistance be incorporated in jettisonable cockpit hood designs. Some firms have preferred designs in which the hood is constrained to rotate through a definite angle before the final release. A short series of tests has, therefore, been made in the 24-ft Wind Tunnel to determine the optimum angle for release. This was found to be about 10 deg, which is considerably less than has been suggested in the past. Cover date is 1952. S. O. code no. 23-2644. ARC RM 2644.

NOTE ON THE EFFECT OF SIZE OF AIRCRAFT UPON THE DIFFICULTIES INVOLVED IN LANDING AN AIRCRAFT, by D. Adamson. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1947. 13p graphs, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107470

The effect of aircraft size upon the response of an aircraft during those manoeuvres which are commonly employed in landing has been examined, and in this way an assessment has been made of the way in which the difficulties experienced by the pilot will go up as aircraft size increases. On the basis of the work summarised in this note it is concluded that the problems associated with landing (from the pilot's point of view at any rate) are likely to be aggravated to such an extent, as the size of aircraft increases up to the limiting size considered in this report (300 ft span), as to make landing really difficult. S. O. code no. 23-2567. Cover date is 1951. ARC RM 2567.

ON THE DESIGN OF AEROFOILS FOR WHICH THE LIFT IS INDEPENDENT OF THE INCIDENCE, by B. Thwaites. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jan 1947. 17p diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.15. PB 107473

It has been shown how lift may be obtained on aerofoils independently of the incidence. In this paper mathematical processes are set out of designing such aerofoils to have specified velocity distributions at certain incidences and lift-coefficients. Approximate and exact methods are given, corresponding to the methods employed in the design of ordinary aerofoils. A full discussion of the characteristics of such aerofoils is given. S. O. code no. 23-2612. Cover date is 1952. ARC RM 2612.

SOME DYNAMIC EFFECTS OF FUEL MOTION IN SIMPLIFIED MODEL TIP TANKS ON SUDDENLY EXCITED BENDING OSCILLATIONS, by Kenneth F. Merten and Bertrand H. Stephenson. U. S. National Advisory Committee for Aeronautics. Sep 1952. 35p photos, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107590

An exploratory investigation of the dynamic effects of fuel sloshing in tip tanks on wing bending motion was conducted with two simplified model beam-tank systems. Envelope curves to beam-displacement time histories obtained after release from a deflected position are compared and show the effects of variation in tank fullness, fluid density, fluid viscosity, and tank shape. Some variations of fluid weight effective from cycle to cycle are also presented. The results of these tests indicate that after several cycles substantial damping may be obtained from fuel sloshing in a tip tank and that the effective mass of the fuel may vary considerable under certain conditions of tank oscillation. The viscosity of the fluid did not affect the damping or inertia characteristics obtained but, for a given beam-tank system, the density of fluid and tank fullness were important parameters. NACA TN 2789.

TESTS ON A "GLAUERT" NOSE-SUCTION AEROFOIL IN THE N.P.L. 4-FT. NO. 2 WIND TUNNEL, by F. Cheers and Olga Douglas. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1947. 5p diagr, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 107543

Tests on an 8.65 per cent thick nose-suction aerofoil designed by Glauert have been made in the 4-ft No. 2 wind tunnel at the National Physical Laboratory at Reynolds numbers 0.385 and 0.577 x 10^6. The results show that the section stalls at a lift coefficient of 1.13 without suction. With suction quantities of 0.003, 0.0045, 0.006 and (with a wider slot) 0.012, the values of $C_{L\,max.}$ were respectively 1.32, 1.34, 1.36 and 1.57. Cover date is 1952. S. O. code no. 23-2356. ARC RM 2356.

THEORETICAL EXAMINATION OF THE EFFECT OF DEADRISE ON WETTED AREA AND ASSOCIATED MASS IN SEAPLANE-WATER IMPACTS, by R. J. Monaghan. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1949. 16p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.15. PB 107491

A theoretical examination is made of the deadrise effect on associated mass and wetted area in the two-dimensional impact case (vertical drop of an infinitely long wedge at zero attitude). Available estimates are summarised and a new theoretical formula is developed by means of an expanding prism flow which gives results for associated mass in very close agreement with those given by Wagner's semi-empirical formula (on which most of the estimates of three-dimensional associated mass have so far been based). In addition the new treatment gives a formula for wetted area which is not available from Wagner's treatment except for very small values of deadrise angle. Comparison is made between these and other formulae in the light both of theory and experiment and a brief survey is made (in Appendix I) of the assumptions involved in applying associated mass methods to motions through a free surface. Cover date is 1952. S. O. code no. 23-2681. **Contents:** Appendix I: Application of associated mass methods to the two-dimensional impact problem. - Appendix II: Mathematical details of the expanding prism analogy to the two-dimensional impact of a wedge of deadrise angle. ARC RM 2681.

WIND-TUNNEL TESTS ON A THICK SUCTION AEROFOIL WITH A SINGLE SLOT, by M. B. Glauert, W. S. Walker, W. G. Raymer and N. Gregory. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1948. 14p drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107547

This report describes the two-dimensional wind-tunnel tests carried out on a 31.5 per cent thick suction aerofoil, GLAS II, which has a single slot on the upper surface at 69 per cent chord. Both suction and blowing were used to prevent separation. Lift, drag, pitching moment and the flow through the slot were measured. Tests without suction were made at Reynolds numbers of 0.96 and 2.88 millions. The results at the two Reynolds numbers were markedly different, and at the higher speed widely varying values of the drag-coefficient were recorded in the same conditions. Two different slot shapes were tested on the model, one with a sharp beak to the front lip, the other with a rounded entry. Cover date is 1952. S. O. code no. 23-2646. ARC RM 2646.

Instruments

FOUR-AND EIGHT-CHANNEL DESYNN GRAPHICAL RECORDERS, by F.R.J. Spearman. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1948. 6p photos Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 107477

A 4-channel recorder, providing continuous traces against time on photographic film, has been developed for use with any instruments employing Desynn transmitters. It is suitable for the measurement of quantities which vary with a maximum frequency of 3 c.p.s. It is made from F.24 camera component parts, and uses the standard magazine and 5-in. wide film. It has been successfully used for flight trials; manufacturing drawings are available. An 8-channel version, of which two or three may be coupled together, is under development. S. O. code no. 23-2636. Cover date is 1952. ARC RM 2636.

METHOD FOR THE DETERMINATION OF THE TIME LAG IN PRESSURE MEASURING SYSTEMS INCORPORATING CAPILLARIES, by Archibald R. Sinclair and A. Warner Robins. U. S. National Advisory Committee for Aeronautics. Sep 1952. 35p diagrs, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107591

A method is presented for the determination of the time lag in pressure measuring systems incorporating capillaries; this method is a convenient and systematic means of selecting, designing, or redesigning a pressure measuring system to meet the time requirements of a particular installation. Experimental data are shown and a step-by-step sample application is presented. NACA TN 2793.

THEORETICAL INVESTIGATION INTO THE LATERAL STABILITY OF AN AEROPLANE CONTROLLED BY AN AUTOMATIC PILOT, WITH PARTICULAR REFERENCE TO THE EFFECT OF FLIGHT PATH ANGLE, by T. W. Prescott. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jan 1948. 11p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 107488

Several autopilots produce aileron deflection proportional to the movement between the aeroplane and the outer gimbal of a vertical gyroscope. In non-level flight this relative movement is not equal to the rotation of the aeroplane about its x-axis, and it was desirable to investigate the lateral stability for steep angles of climb and dive. Calculations show that instability does occur, but that stability can be restored either by making the rudder deflection dependent on aileron movement in order to counteract the aileron drag coefficient, or by adding a rate of yaw term to the rudder circuit. The addition of either term alone. The aileron drag coefficient can also have a detrimental effect at the start of an automatic turn, and response curves during entry into the turn have been calculated for various degrees of aileron drag compensation. The bank angle and sideslip response

curves are unaffected by the compensation. The rate of turn response is improved during the first second but subsequently is little affected by aileron drag compensation. Cover date is 1952. S. O. code no. 23-2640. Contents: Appendix: Data for Meteor type jet fighter flying at sea level. ARC RM 2640.

Engines and Propellers

CORRELATION OF TENSILE STRENGTH, TENSILE DUCTILITY, AND NOTCH TENSILE STRENGTH WITH THE STRENGTH OF ROTATING DISKS OF SEVERAL DESIGNS IN THE RANGE OF LOW AND INTERMEDIATE DUCTILITY, by Arthur G. Holms and Andrew J. Repko. U. S. National Advisory Committee for Aeronautics. Sep 1952. 30p diagrs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107562

Burst tests were conducted on several designs of sound disks and disks with defects and results were compared with tensile strength, tensile ductility, and notch tensile strength. For the brittle materials, the disk strength did not correlate with tensile strength. For the brittle materials and for ductile materials for which notch strength data were available, the disk strength was found to correlate better with the combination of tensile strength and notch strength ratio than with the combination of tensile strength and elongation. For disks with defects, the notch tensile strength was superior to the conventional tensile strength. NACA TN 2791.

EFFECTS OF WING SWEEP ON THE UPWASH AT THE PROPELLER PLANES OF MULTIENGINE AIRPLANES, by Vernon L. Rogallo. U. S. National Advisory Committee for Aeronautics. Sep 1952. 46p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107592

An analysis is presented to give a qualitative picture of the effects of wing sweep on the upwash at the propeller planes of multiengine airplanes. In order to provide a basis for judging effects of sweep, comparisons are made of the upwash and upflow angles at the propeller planes of two hypothetical airplanes of the high-speed long-range type, one having an unswept wing and the other a swept-back wing. The effects of compressibility are considered. Charts are provided to enable the prediction of upwash in the chord-plane region ahead of wings of various plan forms. NACA TN 2795.

NOTES ON HELICOPTER ROTOR BEHAVIOR AFTER ENGINE FAILURE IN HOVERING FLIGHT, by W. Stewart and G. J. Sissingh. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1949. 6p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 107489

Calculations have been made of the changes in rotor speed following engine failure on a typical helicopter in hovering flight. Various time functions for the collective pitch operation are considered. The results are in excellent agreement with the one recorded case of an actual power failure in hovering flight. Rapid pilot action in reducing the collective pitch after engine failure is essential to prevent dangerously low rotational speed of the blades. The possibilities of automatic pitch reduction or of a power failure warning to the pilot are considered. Cover date is 1952. S. O. code no. 23-2659. ARC RM 2659.

SOLUTIONS OF LAMINAR-BOUNDARY-LAYER EQUATIONS WHICH RESULT IN SPECIFIC-WEIGHT-FLOW PROFILES LOCALLY EXCEEDING FREE-STREAM VALUES, by W. Byron Brown and John N. B. Livingood. U. S. National Advisory Committee for Aeronautics. Sep 1952. 36p graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107632

Revised solutions of the laminar-boundary-layer equations for cases which involved cooling at the wall combined with large pressure gradients in the main stream produced specific-weight-flow profiles which locally exceeded free-stream values. Heat-transfer and friction coefficients, boundary-layer thicknesses, and velocity, temperature, and specific-weight-flow distributions resulting from the revised solutions are presented for Euler numbers of 0.5 and 1, stream-to-wall temperature ratios of 2 and 4, and cooling-air flow rates through porous walls designated by flow parameters of 0, -0.5, and -1. NACA TN 2800.

Aerodynamics

APPLICATION OF THE LINEAR PURTURBATION THEORY OF COMPRESSIBLE FLOW ABOUT BODIES OF REVOLUTION, by A. D. Young and S. Kirby. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1947. 8p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 107476

1. Flow, Compressible - Theory - Gt. Brit. 2. Bodies of revolution - Velocity - Compressibility effects - Gt. Brit. 3. Glauert law 4. ARC RM 2624.

S. O. code no. 23-2624. Cover date is 1952. Theory is developed in RM1909.

COMPARATIVE TESTS OF THICK AND THIN TURNING VANES IN THE ROYAL AIRCRAFT ESTABLISHMENT 4 X 3-FT WIND TUNNEL, by K. G. Winter. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Aug 1947. 5p diagrs, graphs, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 107485

The tests were made by replacing the existing centre six thick vanes at the first corner of the 4 x 3-ft wind tunnel by vanes of sheet metal. The thin vanes reduced the corner loss, estimated from a wake traverse behind one vane, without any deterioration in outflow, and are therefore recommended for use in future wind tunnels. Cover date is 1952. S. O. code no. 23-2589. ARC RM 2589.

METHOD FOR CALCULATION OF COMPRESSIBLE LAMINAR BOUNDARY-LAYER CHARACTERISTICS

IN AXIAL PRESSURE GRADIENT WITH ZERO HEAT TRANSFER, by Morris Morduchow and Joseph H. Clarke. U. S. National Advisory Committee for Aeronautics. Sep 1952. 43p graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107494

The Karman-Pohlhausen method is extended primarily to sixth-degree velocity profiles for determining the characteristics of the compressible laminar boundary layer over an adiabatic wall in the presence of an axial pressure gradient. It is assumed that the Prandtl number is unity and that the coefficient of viscosity varies linearly with the temperature. A general approximate solution which permits a rapid determination of the boundary-layer characteristics for any given free-stream Mach number and given velocity distribution at the outer edge of the boundary layer is obtained. A simple method based on the use of a seventh-degree velocity profile is derived for the special purpose of calculating the location of the separation point in an adverse pressure gradient. NACA TN 2784.

NOTE ON SIR GEOFFREY TAYLOR'S CRITERION FOR THE RATE OF BOUNDARY-LAYER SUCTION AT A VELOCITY DISCONTINUITY, by N. Gregory. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1947. 12p photo, diagr, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107545

Sir Geoffrey Taylor's criterion for the rate of boundary-layer suction at a velocity discontinuity is described, and is compared with experimental results obtained from boundary-layer explorations. It is found that, despite neglect of the pressure gradient due to the curvature of the flow, the criterion gives reasonable estimates of the suction quantity. On the other hand, close agreement with velocity profiles is only obtained when the pressure gradient is taken into account. Cover date is 1952. S. O. code no. 23-2496. ARC RM 2496.

ON TRANSONIC FLOW PAST A WAVE-SHAPED WALL, by Carl Kaplan. U. S. National Advisory Committee for Aeronautics. Aug 1952. 43p graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107395

The simplified nonlinear differential equation for transonic flow past a wavy wall is solved by the method of integration in series. A general procedure for the solution of the resulting recurrence formulas is shown and illustrated by a number of examples. A numerical test of convergence is applied to a key power series in k, the transonic similarity parameter, and leads to the conclusion that smooth symmetrical potential flow past the wavy wall is no longer possible when the critical value of the stream Mach number is exceeded. Extension of TN 2383 (PB 103949). NACA TN 2748.

SOLUTION BY LIFTING-LINE THEORY OF PROBLEMS INVOLVING DISCONTINUITIES, by V. M. Falkner. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1947. 23p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.50. PB 107471

The report describes how wing loading problems involving discontinuities are solved by lifting-line theory. The four discontinuities considered are (a) direction of leading or trailing edge, (b) incidence, (c) two-dimensional lift slope and (d) chord. As the effects of the first are of minor importance in lifting-line theory, attention is mainly confined to the last three, the solution being based on the use of a few terms of a Fourier series in conjunction with special functions tabulated elsewhere. The work is limited to straight unyawed flight and includes lift, induced drag, and pitching, rolling and yawing moments, all with or without deflected landing flaps and ailerons. The method of formation of the equations, and the solutions of a representative range of problems for a hypothetical wing, including loading due to incidence, symmetrical wing twist, uniform roll, and deflected flaps and ailerons, are fully described. S. O. code no. 23-2592. Cover date is 1952. ARC RM 2592.

TESTS ON A CONTROL WITH FIXED TRAILING-EDGE ANGLE, AND SURFACES OF BARIABLE CAMBER, by A. S. Halliday, H. Deacon and W. C. Skelton. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1947. 15p drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107484

The report describes experiments to determine the effect of surface distortion on the hinge moments of a control and to investigate the importance of a rigid trailing edge in the prevention of large changes in hinge-moment coefficient. The results shows that by designing the control so that the surface at the trailing edge, extending over one-eighth of the chord, is incapable of distortion, then the value of b_2 remains almost constant within the limits on any possible distortion forward of the fixed portion. It has also been found that b_1 is more constant. Changes in centre-line camber of the deformed portion of the control can still produce an effective change in b_2 when camber varies with the control angle, although the amount of this change may be roughly halved. Cover date is 1952. S. O. code no. 23-2495. ARC RM 2495.

USE OF A CONSOLIDATED POROUS MEDIUM FOR MEASUREMENT OF FLOW RATE AND VISCOSITY OF GASES AT ELEVATED PRESSURES AND TEMPERATURES, by Martin B. Biles and J. A. Putnam. U. S. National Advisory Committee for Aeronautics. Sep 1952. 51p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107589

Use of a consolidated porous medium as a gas-metering device and for determination of gas viscosity has been investigated over a moderate range of temperature and pressure. With normal laboratory techniques it appears possible to calibrate large porous Alundum filtering thimbles to meter gas with a probable error of 0.1 to 0.2 percent. The geometry of such elements permits an appreciable range of gas flow rate to be metered with small, accurately controlled, pressure drops. The advantages of such

a device warrant its use as a laboratory instrument. Results of the flow tests have been employed in the determination of the viscosity of air up to approximately 900 pounds per square inch absolute at the two test temperatures of 75° and 517°F. NACA TN 2783.

Micellaneous

ANNUAL REPORT ON SAFETY IN MINES RESEARCH, 29TH, 1950. Gt. Brit. Ministry of Fuel and Power. 1952. 52p photos, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 107431

1. Mines and mining - Safety measures - Gt. Brit. S. O. code no. 41-95-0-50.

BIBLIOGRAPHY OF INDUSTRIAL DRYING, VOLS. I-III. Gt. Brit. Dept. of Scientific and Industrial Research. Dec 1951. 839p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $6.25. PB 107512

The value of efficient drying processes to industry has grown in recent years with the great need for fuel saving. The exchange between those concerned of up-to-date information on drying problems can help to speed the use of methods of drying that may lead to improved efficiency and output. The bibliography now published covers the period of 1924-50 and its eight hundred pages carry some four thousand, five hundred entries. The first tow sections of the work deal with principles, processes and equipment, and include a limited number of references on heat transfer and drying of gases. A further three sections cover the various drying methods that can be used in agriculture, in the food processing industry and in the drying of industrial materials. Each section is divided by sub-headings under which the references are listed alphabetically. Contents: Vol. I, Sec. 1: Principles of drying. - Sec. 2: Drying processes and equipment. - Vol. II, Sec. 3: Agriculture. - Sec. 4: Food. - Vol. III, Sec. 5: Industrial materials. - List of sources quoted in the text.

GERMAN STANDARDIZED OR UNIFORM ACCOUNTING SYSTEM. BIOS TRIP NO. 3144. DATE OF INVESTIGATION FROM 4TH MAY 1947 TO 25TH JUNE 1947, by C. F. Owen. 1947. 1079f diagr, graphs, tables (Text in German and English) Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Enlargement Print $141.25. PB 107500

1. Accounting - Methods - Germany 2. Cost accounting - Germany 3. Cigarettes - Manufacture - Germany 4. Feeding and feedingstuffs - Germany 5. Fruit - Processing - Germany 6. Vegetables - Processing - Germany 7. Reichskuratorium für Wirtschaftlichkeit 8. BIOS trip 3144 9. Micro BIOS FD 674/49, Frames 1-937.

English abstract included. Abstract available as PB 107500s from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Accompained by the following documents: 1. Allgemeine regeln zur industriellen kostenrechnung, hrsg: von Reichsgruppe Industrie, Berlin, bearbeitet von Dr. Adolf Müller. 1942 (General rules for industrial cost accounting). - 2. Kontenplan für den maschinenbau. (Accountancy plan for the mechanical engineering trade) Oct 1939. - 3. Kontenrahmen und richtlinien für die geschäftsbuchführung in der textilindustrie (Basic plan and guiding principles for trading accounts in the textile industry) Sep 1938. Summary in English. - 4. Normalkontenplan für die wirtschaftsgruppe fahrzeugindustrie, no. 1 (Standard accountancy plan for the vehicle industry, no. 1) Jul 1937. - 5. Normalkontenplan für die wirtschaftsgruppe der papier, pappen-, zellstoff-und holzstoff-erzeugung, teil 1 (Standard accountancy plan for paper, cardboard cellulose and wood pulp producing industries, pt. 1) 1938. Summary in English. - 6. 132 Kontenplans for various industries as recently published (May 1937) in Berlin for use in connection with the reintroduction of standardized accounting in German industry. - 7. Bericht über die betriebsuntersuchung in der zigaretten-industrie (Report on investigations into the working of the cigarette industry) 1938. - 8. Bericht über die betriebsuntersuchung in der mischfutter-industrie (Report on investigations into the working of the mixed fodder industry) Nov 1939. 9. Bericht über die betriebsuntersuchung in der obst-und gemüseverwertungs-industrie (Report on investigations into the working of the fruit and vegetable processing industry. 1942. - 10. RKW Schriften-verzeichnis (Catalog of publications of the Reichskuratorium für Wirtschaftlichkeit) Oct 1941.

INVESTIGATIONS ON THE MITOCHONDRIA OF THE HOUSEFLY MUSCA DOMESTICA L. I: ADENOSINE TRIPHOSPHATASES (ATPASE) by Bertram Sacktor. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Aug 1952. 23p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107641

1. Musca domestica - Mitochondria 2. Muscles, Insect - Dephosphorylating mechanisms 3. Adenosinetriphosphatase - Effect on muscles 4. CCMD RR 128. Project no. 4-65-20-001.

NUMERICAL INDEX SUPPLEMENT TO THE BIBLIOGRAPHY OF SCIENTIFIC AND INDUSTRIAL SERVICES, VOL. 17, JAN-JUN 1952, COMPILED by D. W. Graf. U. S. Office of Technical Services. Aug 1952. 10p Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.25. PB 98050s7

Supplement to PB 98050.

RESPONSE MECHANISMS AT THE VISUAL THRESHOLD, A METHODOLOGICAL STUDY, UNDER CONTRACT N6ONR-180, TASK ORDER IV, PROJECT NR140-253. 10p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107382

1. Visual perception 2. Visual research.

Patents

Electrical Machinery

GERMAN PATENT APPLICATIONS CLASS 21B, GALVANIC CELLS, STORAGE BATTERIES AND THERMOCOUPLES, AND 21C, ELECTRICAL CONDUCTION AND WIRING SYSTEMS, INCLUDING INSULATING MATERIALS, SWITCHES, REGULATORS AND SWITCHING METHODS. Reichspatentamt, Berlin. 1930-1945. 1010f Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Enlargement Print $127.50. PB 83364

This FIAT microfilm reel consists of 152 German patent applications as listed below. Individual items will be available as enlargement prints only; the entire reel may be purchased in microfilm form for $9.00. Please include PB and frame numbers when ordering individual items from this microfilm reel.

Frames	Title	Price
7637-7642	Galvanic cell with air depolarization. Franke (Gebrüder) K. G. Ger. patent application F 89 830 IVb/21b dated Sep 16, 1942.	$2.50
7643-7646	Storage battery. Erb, O. (Inventor). Ger. patent application E 55 726 dated Feb 2, 1942.	$2.50
7647-7652	Compound electric dust precipitator. Lurgi, Gesellschaft für Wärmetechnik m.b.H., Frankfurt am Main. Ger. patent application L 91 349 Ivb/21c dated Dec 19, 1939.	$2.50
7653-7656	These frames are illegible.	
7657-7662	Dry cell with air depolarization. Etztold & Raessler K. G., Berlin and others. Ger. patent application E 53 531 dated Dec 18, 1941.	$2.50
7663-7665	Frame-type wire resistor, especially for electric railways. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 107 080 VIIIb/21c dated Mar 4, 1942.	$2.50
7666-7668	Rapid charging storage battery. Krüger, J. (Inventor). Ger patent application K 166 082 IVb/21b dated Oct 6, 1942.	$2.50
7669-7675	Slide overload breaker for coaxial cables. Telefunken Gesellschaft für Drahtlose Telegraphie m.b.H., Berlin. Ger. patent application T 58 014 VIIIb/21c 5/03 dated Sep 21, 1942.	$2.50
7676-7685	Steam circuit breaker of columnar construction. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 154 043 VIIIb/21c 36/03 dated Sep 18, 1943.	$2.50
7686-7690	Terminal block for electric cables. Petri, O. (Inventor). Ger. patent application P 79 350 VIIIb/21c 23/01 dated Mar 23, 1942.	$2.50
7691-7700	Multistrand movable telecommunication cable. Siemens & Halske A. G., Berlin. Ger. patent application S 139 786 VIIIb/21c 5/10 dated Aug 28, 1943.	$2.50
7701-7703	Paper wrappers (reinforced with organic or mineral fibers) for electric conductors. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 138 862 VIIIb/21c 2/20-14B45/42 dated Jun 17, 1944.	$2.50
7704-7708	Arrangement for producing insulated strands for telegraph cables. Vogel (C. J.) Draht und Kabelwerke, Berlin. Ger. patent application dated Mar 18, 1942.	$2.50
7709-7712	Insulation foil with predetermined temperature coefficient of capacitance. Siemens & Halske A. G., Berlin. Ger. patent application S 130 363 VIIIb/21c 2/14 dated Apr 20, 1943.	$2.50
7713-7715	Clamps with cross-joints. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 144 618 VIIIb/21c 27/02 dated May 28, 1942.	$2.50
7716-7718	Frequency-controlled operation of a multiplicity of relays. Rupp, O. (Inventor). Ger. patent application dated Aug 30, 1944. Supplement to patent application R 119 362 VIIIb/21c.	$2.50
7719-7728	Construction of switching and distribution installations. Voigt & Haffner A. G., Frankfurt am Main. Ger. patent application V 38 890 VIIIb/21c 27/04 dated Jun 22, 1942.	$2.50
7729-7736	Pole-reversing switch for several control circuits. Siemens & Halske A. G., Berlin. Ger. patent application S 152 362 VIIIb/21c 46 dated Oct 8, 1942.	$2.50

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7737-7741	Mounting arrangement for metallic caps on cylindrical insulators, especially for fuses. Licentia Patent-Verwaltungs G.m.b.H., Berlin. Ger. patent application dated Jan 29, 1945.	$2.50
7742-7747	Method for the production of corrugated external conductors for high-frequency coaxial cables. Licentia Patent-Verwaltungs G.m.b.H., Berlin. Ger. patent application dated Jan 25, 1943.	$2.50
7748-7750	External conductor for coaxial high-frequency cables and production methods. Ger. patent application dated Oct 16, 1942.	$2.50
7751-7753	Pneumatic drive, especially for high-frequency switches. Ger. patent application dated Dec 4, 1942.	$2.50
7754-7757	Case for loading coils. Licentia Patent-Verwaltungs G.m.b.H., Berlin. Ger. patent application dated Dec 23, 1942.	$2.50
7758-7762	Terminal clamp for overhead lines. Laurick, H. and others (Inventors). Ger. patent application L 110 054 VIIIb/21c dated Dec 28, 1942.	$2.50
7763-7767	Pressure-gas circuit breaker with main and auxiliary contacts or electrodes. Ger. patent application L 109 052 VIIIb/21c 35 dated Nov 10, 1943.	$2.50
7768-7770	Switch gear for transformers, rectifiers or electric motors. Licentia Patent-Verwaltungs G.m.b.H., Berlin. Ger. patent application dated Jun 2, 1942.	$2.50
7771-7774	Flexible clamp for conductors. Wieland, F. (Inventor). Ger. patent application dated Mar 17, 1943.	$2.50
7775-7778	Arrangement for producing flexible socket contacts. Hannemann (Gebrüder) G.m.b.H., Düren. Ger. patent application H 160 158 VIIIb/21c 21 dated Jul 17, 1939.	$2.50
7779-7784	Overload relay. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application dated Jul 3, 1940.	$2.50
7785-7792	Movable telecommunication cable. Siemens & Halske A. G., Berlin. Ger. patent application dated Feb 6, 1940.	$2.50
7793-7796	Method for the production of insulating coverings with application of fiber glass and binding agents. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 141 955 VIIIb/21c 2/01 dated Aug 10, 1940.	$2.50
7797-7814	Compound circuit breaker. Ger. patent application R 83 826 VIIIb/21c 35 dated Jan 16, 1932.	$3.75
7815-7826	Circuit breaker. Ger. patent application dated Sep 13, 1935.	$3.75
7827-7829	Hydraulic damping device. Rothmann, W. (Inventor). Ger. patent application dated Apr 7, 1943.	$2.50
7830-7832	Pin insulator. Karl, G. (Inventor). Ger. patent application K 151 712 VIIIb/21c 16 dated Jul 1, 1943. Supplement to patent application K 151 438 VIIIb/21c.	$2.50
7833-7834	Method for plasticizing thermoplastics for electrical purposes. Rheinische Draht- und Kabelwerke G.m.b.H., Cologne. Ger. patent application dated Nov 19, 1936.	$2.50
7835-7841	Pressure-gas circuit breaker. Ger. patent application R 94 914 VIIIb/21c 35 dated Dec 5, 1935.	$2.50
7842-7844	Dead tank for circuit breakers using a small quantity of oil. Ger. patent application Jan 1, 1944.	$2.50
7845-7851	Fuse for low-current devices. Elen, Elektrotechnische Fabrik Frees & Ditt, Martinstahl-reinigau. Ger. patent application dated Dec 5, 1942.	$2.50
7852-7862	Spacer for air-space insulated cables. Felten & Guilleaume Carlswerk A. G., Cologne. Ger. patent application F 88 654 VIIIb/21c 5/03 dated Sep 2, 1943.	$3.75
7863-7867	Knife-blade switch and similar devices. "Elin" und Schorch-Werke A. G., für Elektrische industrie, Vienna. Ger. patent application E 55 755 VIIIb/21c 28 dated Jul 15, 1944.	$2.50
7868-7871	Powdered iron core coil, especially loading coil for telecommunication cables. Felten & Guilleaume Carlswerk A. G., Cologne. Ger. patent application F 93 182 VIIIb/21c 5/23 dated Jan 14, 1944.	$2.50

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7872-7877	Indicator for blown cartridge fuses. Focke-Wulf Flugzeugbau G.m.b.H., Bremen. Ger. patent application dated Jan 27, 1945.	$2.50
7878-7887	Air circuit breaker. Ger. patent application R 95 999 VIIIb/21c 35 dated Apr 24, 1936.	$2.50
7888-7893	Remote control arrangement. Blaupunkt-Werke G.m.b.H., Berlin. Ger. patent application B 190 573 VIIIb/21c 46 dated Apr 27, 1940.	$2.50
7894-7896	Articulated joint for electric conductors. Licentia Patent-Verwaltungs- G.m.b.H., Berlin. Ger. patent application dated Apr 21, 1941.	$2.50
7897-7899	Contacts for power switches. Ger. patent application L 103 992 VIIIb/21c 40/52 dated Mar 12, 1943.	$2.50
7900-7902	Support for cables with thin sheaths. Kabelwerk Wilhelminenshof A. G., Berlin. Ger. patent application dated Apr 26, 1939.	$2.50
7903-7909	Transmission system for angular displacement. Askania-Werke A. G., Berlin. Ger. patent application A 88 159 VIIIb/21c 46/02 dated Jun 5, 1942.	$2.50
7910-7912	Cable spacing shell for series application. Bettermann (Fr.) Stanzwerke, Lendringsen-Westfalen. Ger. patent application D 193 297 VIIIb/21c dated Jan 26, 1943.	$2.50
7913-7920	Flexible wave guide for microwaves. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application dated Feb 26, 1941.	$2.50
7921-7924	Method for drying core conductors of sheathed cables. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 136 091 VIIIb/21c 7/05 dated Sep 30, 1942. Supplement to patent application S 135 423 VIIIb/21c.	$2.50
7925-7926	Braking circuit for d-c motors. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 106 598 VIIIb/21c 59/10 dated Mar 6, 1941.	$2.50
7927-7935	Method for desensitizing a-c relays. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 114 352 VIIIb/21c 63-11B 79/42 dated Jan 5, 1944.	$2.50
7936-7942	Pressure-gas circuit breaker. Ger. patent application St 62 213 VIIIb/21c 35 dated Sep 27, 1943.	$2.50
7943-7945	Coupling for cables, electric conductors and the like. Apparatebau-Gesellschaft Neumann & Borm, Berlin. Ger. patent application A 96 535 VIIIb/21c 24/02 dated Sep 15, 1943.	$2.50
7946-7949	Telecommunication cable with symmetrical strand arrangement for the transmission of higher frequencies. Allgemeine Elektricitäts-Gesellschaft, Berlin. Ger. patent application dated Aug 24, 1937. Supplement to patent application A 79 164.	$2.50
7950-7957	Power switch equipment. Allgemeine Elektricitäts-Gesellschaft, Berlin. Ger. patent application A 83 370 VIIIb/21c 36/01 dated Jun 23, 1937.	$2.50
7958-7967	Toggle switch. Busch-Jaeger-Lüdenscheider Metallwerke A.G., Lüdenscheid. Ger. patent application B 193 912 VIIIb/21c 28/02 dated May 27, 1943.	$2.50
7968-8004	Circuit breaker with arc extinction by gases or vapors. Ruppel, S. (Inventor). Ger. patent application dated Nov 20, 1934.	$6.25
8005-8011	Overload relay. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 142 327 VIIIb/21c 68/01 dated Oct 6, 1943.	$2.50
8012-8033	Cathode-ray tube image pick-up. Ger. patent application dated Aug 3, 1935.	$5.00
8034-8042	Arragement for the elimination of interference on high-sensitivity relays, especially in aircraft. Bruhn-Werke G.m.b.H., Berlin. Ger. patent application B 202 265 VIIIb/21c 46/50 dated Apr 19, 1943. Supplement to patent application O 24 660 VIIIb/21c 46/50.	$2.50

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8043-8046	Plastic band for electric insulation. Ger. patent application A 89 436 VIIIb/21c 2/22 dated Jun 22, 1944.	$2.50
8047-8050	Gas circuit breaker. Ger. patent application St 59 273 VIIIb/21c 35 dated Jun 10, 1943. Supplement to Ger. patent 670 720.	$2.50
8051-8058	Arrangement for monitoring the frequency of a-c circuits. Siemens & Halske A. G., Berlin. Ger. patent application S 140 751 VIIIb/21c 64/57 dated Apr 16, 1940.	$2.50
8059-8069	Sealed switching equipment. Ger. patent application dated Dec 2, 1935.	$3.75
8070-8077	Expansion switches. Ger. patent application dated Jul 30, 1935.	$2.50
8078-8100	Arc-extinction arrangement. Ger. patent application dated Jul 19, 1935.	$5.00
8101-8125	Arc-extinction arrangement using gas or vapors. Ger. patent application dated May 15, 1935.	$5.00
8126-8129	Methods for preventing wrong connections in telephone systems using quads. Hackenthal Draht und Kabelwerke A. G., Hannover. Ger. patent application H 122 690 VIIIb/21c[1] dated Apr 8, 1930. Supplement to patent application H 122 434.	$2.50
8130-8138	Cathode-ray tube with secondary emission. Rogowski, W. and others (Inventors). Ger. patent application dated Jan 7, 1935. Supplement to patent application R 90 444 VIIIc/21g 13/10.	$2.50
8139-8146	Circuit breaker using a dead tank. Ruppel, S. (Inventor). Ger. patent application dated Mar 7, 1935. Supplement to patent application R 83 826 VIIIb/21c.	$2.50
8147-8153	Frequency dependent activation of a multiplicity of relays on a control circuit. Rupp, O. (Inventor). Ger. patent application dated Aug 14, 1944.	$2.50
8154-8160	Switching unit. Voigt & Haeffner A. G., Frankfurt am Main. Ger. patent application dated Mar 29, 1941.	$2.50
8161-8165	Residential circuit connection to mains networks. Jordan, P. (Inventor). Ger. patent application dated Jul 8, 1940.	$2.50
8166-8175	Arrangement for avoiding arc failures. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 140 753 VIIIb/21c 68/01 dated Aug 27, 1942.	$2.50
8176-8181	Flexible clamp. Deutsche Versuchsanstalt für Luftfahrt E. V., Berlin. Ger. patent application dated Jun 25, 1940.	$2.50
8182-8187	Ceramic cable insulation. Porzellanfabrik Kahla, Kahla-Thüringen. Ger. patent application dated Jun 22, 1936.	$2.50
8188-8193	Thermal overload relay. Nostitz & Koch, Chemnitz. Ger. patent application N 45 258 VIIIb/21c 69 dated Aug 30, 1943.	$2.50
8194-8227	Compound circuit breaker. Ger. patent application dated Aug 25, 1934.	$6.25
8228-8231	Counter with electric clockwork. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 147 974 VIIIb/21c 27/01 dated Jan 14, 1944.	$2.50
8232-8237	Oil circuit breaker. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 147 446 dated Jan 14, 1944.	$2.50
8238-8283	Photoelectric control for regulating devices. Graner, H. and others (Inventor). Ger. patent application G 102 101 VIIIb/21c 46/50 dated Jul 27, 1940.	$7.50
8284-8289	Control for reversing rolling mills. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 108 127/21c dated Jun 23, 1943. Supplement to patent application L 99 748 VIIIb/21c 62/50.	$2.50
8290-8296	Rapid-action overload relay. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 100 192 VIIIb/21c 68/01 dated Feb 20, 1940.	$2.50
8297-8302	Terminal clamp. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 102 747 VIIIb/21c dated Dec 14, 1940. Supplement to patent application A 81 278.	$2.50

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8303-8306	Cable-drum trailer. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 102 763 VIIIb/21c 8/01, dated Dec 12, 1940.	$2.50
8307-8312	Arrangement for application of lacquer to wire surfaces. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 102 764 VIIId/21c dated Dec 13, 1940.	$2.50
8313-8316	Electric insulating material. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 102 768 VIIIb/21c 2 dated Dec 18, 1940.	$2.50
8317-8327	Protective arrangement for a-c power equipment. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 104 526 VIIIb/21c 68 dated Jun 6, 1941.	$3.75
8328-8333	Control for synchro motors. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 105 222 VIIId/21c dated Aug 27, 1941.	$2.50
8334-8336	Insulating varnish. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 105 329 VIIIb/21c7 dated Sep 8, 1941.	$2.50
8337-8340	Terminals for high-frequency coaxial cables. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106 091 VIIIb/21c dated Nov 28, 1941. Inventor: Jung-Zaeper, C.	$2.50
8341-8359	Electrical device with supplementary parts, to be used as socket, lead-in, gastight lead-in, junction, or remote-control switch, especially for motor vehicles, aircraft and boats. Keist, L. and others (Inventors). Ger. patent application K 166 515 dated Nov 17, 1942.	$3.75
8360-8361	Method for coating cables. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 107 082 VIIIb/21c 19 dated Mar 5, 1942.	$2.50
8362-8368	Starting and brake arrangement for electric railways. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106 114 VIIIb/21c dated Dec 2, 1941.	$2.50
8369-8373	Screw-top for housings of explosion-proof switches or the like. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 103 666 VIIIb/21c dated Mar 17, 1941.	$2.50
8374-8378	Flexible clamp for electric conductors. Wieland, F. (Inventor). Ger. patent application W 111 651 dated Sep 11, 1942.	$2.50
8379-8386	Protective arrangement for parolled-connected electric lines. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 107 691 VIIIb/21c 68 dated Apr 29, 1942.	$2.50
8387-8390	Method for insulating electric cables and conductors, especially for low-voltage power transmission. Ger. patent application L 112 199 VIIIb/21c7 dated Aug 19, 1943.	$2.50
8391-8396	Sleeve or terminal for high-voltage cables. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 105 568 VIIIb/21c dated Oct 7, 1941.	$2.50
8397-8401	Switching arrangement for electric conductors. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 105 608 VIIIb/21c dated Oct 24, 1941.	$2.50
8402-8406	Trailer for transporting and laying cables. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106 082 VIIIb/21c dated Nov 27, 1941.	$2.50
8407-8410	Arrangement for inertialess regulation of grid-controlled discharge spaces. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106382 VIIIb/21c 35 dated Dec 16, 1942.	$2.50
8411-8421	Differential switch. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 104 527 VIIIb/21c 68 dated Jun 6, 1941.	$3.75
8422-8431	Electric device with arc-exposed ceramic parts. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106 411 dated Jan 7, 1942.	$2.50

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8432-8435	Pressure-gas circuit breaker. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106 621 VIIIb/21c 35 dated Jan 26, 1942.	$2.50
8436-8442	Ground protection for single-phase generators. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 107 133 VIIIb/21c 68 dated Mar 10, 1942.	$2.50
8443-8448	Contacts for cable terminals. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 108 680 dated Aug 8, 1942.	$2.50
8449-8453	Step switch for heating pads and the like. Gottfreund & Co., Fabrik Elektrischer Gebrauchs-Apparate, Ulm-Danube. Ger. patent application dated Jun 20, 1942.	$2.50
8454	Plugs for radio receivers. Passhaus, R. (Inventor). Ger. patent application dated Nov 20, 1944.	$2.50
8455-8464	Overvoltage protection. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 127 259 VIIIb/21c 72 dated Jul 4, 1939.	$2.50
8465-8470	Cartridge fuse. Müller (Jean) Elektrotechnische Fabrik, Eltville-Rhine. Ger. patent application dated Mar 12, 1943.	$2.50
8471-8476	Arrangement for wrapping insulation strips on cable strands. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 107 975 VIIIb/21c 5/02 dated Apr 29, 1943.	$2.50
8477-8483	Arrangement for arc extinction. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 118 465 VIIIb/21c 35 dated Sep 20, 1935.	$2.50
8484-8487	High-frequency cable. Kabelwerk Vacha A. G., Vacha-Rhön. Ger. patent application dated Nov 26, 1938.	$2.50
8488-8491	Composite high-frequency cable. Ger. patent application dated Aug 28, 1937.	$2.50
8492-8495	Inductance-free wire-wound resistor, especially for impulse generators. Ger. patent application L 110 773 VIIIb/21c dated Mar 6, 1943.	$2.50
8496-8500	Insulated suspension for electric insulators. Ger. patent application L 110 777 VIIIb/21c dated Mar 6, 1943.	$2.50
8501-8505	Multi-strand cable with rubber insulation. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 103 674 /21c 7/01 dated Mar 18, 1941	$2.50
8506-8512	Insulating material, especially for use in electric capacitors. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 103 532 VIIIb/21c[2] dated Mar 6, 1941.	$2.50
8513-8516	Method for producing cable insulation consisting of longitudinally applied bands. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 102 612 VIIIb/21c7 dated Dec 4, 1940.	$2.50
8517-8520	Method for removal of superfluous cable impregnating materials. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 102 082 VIIIb/21c7 dated Oct 12, 1940.	$2.50
8521-8527	Shaping of strands for high-voltage cables. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 111 477 VIIIb/21c dated May 13, 1943.	$2.50
8528-8530	Screw-type lead-in for explosion and fire damp-proof switch housings. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106 243 VIIIb/21c 10 dated Dec 15, 1941.	$2.50
8531-8533	Electric insulating material. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106 837 VIIIb/21c 2 dated Feb 16, 1942.	$2.50
8534-8535	Method for producing thin plates of mica sheets and binders. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106 874 VIIIb/21c 2 dated Apr 7, 1943.	$2.50
8536-8541	Arrangement for mounting overhead lines on bell-type insulators. Lane, H. (Inventor). Ger. patent application L 106 875 VIIIb/21c dated Feb 13, 1942.	$2.50

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8542-8545	Foot-operated switch. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106 980 dated Feb 25, 1942.	$2.50
8546-8547	Flexible leads for electric heaters. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 107 013 VIIIb/21c7 dated Feb 27, 1942.	$2.50
8548-8550	Method for sealing plastic-sheathed cables in lead-ins of terminal blocks and the like. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 107 054 VIIIb/21c 23 dated Mar 4, 1942.	$2.50
8551-8554	Locking arrangement for electric plugs. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 111 247 dated Apr 17, 1943.	$2.50
8555-8557	Wall control board for mounting of clamps, conductors and relays. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 110 906 VIIIb/21c dated Mar 18, 1943.	$2.50
8558-8560	Arrangement for mounting electric conductors. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 110 868 VIIIb/21c dated Mar 15, 1943.	$2.50
8561-8562	Switch for miniature electric tools. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 110 860 dated Mar 15, 1943.	$2.50
8563-8565	Multiple clamp for mounting electric conductors. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 110 480 VIIIb/21c dated Feb 9, 1943.	$2.50
8566-8570	Method for producing a mechanical and electrically conductive connection between a rigid and a flexible conductor. Ger. patent application L 110 389 dated Feb 1, 1943.	$2.50
8571-8572	Indoor high-voltage switching equipment. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 110 388 VIIIb/21c dated Feb 1, 1943.	$2.50
8573-8578	Carrier for sliding contacts, especially for machine tools. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 110 339 VIIIb/21c 14 dated Jan 27, 1943.	$2.50
8579-8586	Thermal switch. List, H. (Inventor). Ger. patent application L 110 177 dated Jan 12, 1943.	$2.50
8587-8591	Mounting for fuses. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 109 601 VIIIb/21c dated Nov 16, 1942. Inventor: Jung-Zaeper.	$2.50
8592-8594	Cable sheath of thermoplastic material. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 109 586 dated Nov 14, 1942.	$2.50
8595-8598	Method for vulcanizing rubber-covered cables and conductors. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 108 021 VIIIb/21c dated May 29, 1942.	$2.50
8599-8602	Removable control board. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 107 678 dated Apr 27, 1942.	$2.50
8603-8607	Clamp for cable mountings. Jung-Zaeper, C. (Inventor). Ger. patent application L 107 355 VIIIb/21c dated Mar 28, 1942.	$2.50
8608-8612	Wire-wound resistor. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 105 646 VIIIb/21c dated Oct 17, 1941.	$2.50
8613-8615	Method for hardening fabric conductors. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 106 146 VIIIb/21c 7 dated Dec 4, 1941.	$2.50
8616-8621	Stranded-wire holder for electric sockets. Lang, L. (Inventor). Ger. patent application L 95 867 dated Oct 14, 1938.	$2.50
8622-8627	Electric switch. Ger. patent application L 95 562 VIIIb/21c 35 dated Apr 16, 1943.	$2.50
8628-8638	Time switch, especially with electromagnetic drive. Ger. patent application L 95 409 VIIIb/21c dated Nov 14, 1938. Supplement to patent application L 91 485 VIIIb/21c.	$3.75
8639-8646	Remote control arrangement. Licentia Patent-Verwaltungs-G.m.b.H., Berlin. Ger. patent application L 99 135 VIIIb/21c 45 dated Sep 26, 1938. Supplement to patent application L 98 456 VIIIb/21c 45.	$2.50